DOCUMENT RESUME

ED 353 405 CE 062 813

AUTHOR Poulton, Bruce R.
TITLE The Workplace Literacy System Project (WLS). Final Performance Report.
INSTITUTION Forsyth Technical Community Coll., Winston-Salem, NC.; North Carolina State Univ., Raleigh.
SPONS AGENCY Office of Vocational and Adult Education (ED), Washington, DC. National Workplace Literacy Program.
PUB DATE Nov 92
CONTRACT V198A1005
NOTE 113p.; A Demonstration Project of the National Workplace Literacy Program. Sara Lee Knit Products Company also participated in the program.
PUB TYPE Reports - Descriptive (141) -- Guides - Non-Classroom Use (055) -- Reports - Evaluative/Feasibility (142)

EDRS PRICE MF01/PC05 Plus Postage.
DESCRIPTORS Adult Basic Education; Adult Literacy; *Computer Assisted Instruction; *Curriculum Development; Demonstration Programs; *Education Work Relationship; High School Equivalency Programs; Inplant Programs; *Literacy Education; Multimedia Instruction; *On the Job Training; *Optical Disks; Outcomes of Education; Postsecondary Education; Program Effectiveness; School Business Relationship; Staff Development
IDENTIFIERS Textile Industry; *Workplace Literacy

ABSTRACT

The Workplace Literacy System Project (WLS) prepared interactive CD-ROM discs containing about 50 hours of instruction and drill in basic skills presented within the context of the textile/apparel manufacturing industry. The project was conducted at a Sara Lee knit products plant in North Carolina. During the project, literacy task analyses were completed for all occupations at the plant, documented for each job position, and organized into a curriculum outline. A total of 376 employees were recruited, and a comprehensive workplace literacy curriculum for the textile industry was developed and recorded on CD-ROM discs. Onsite instructional programs using both group instruction and computer-based programs were in operation during the 18 months of the project. Instruction was made available in a high school equivalency program, a job enhancement skills program, a metric mathematics program, and the comprehensive curriculum on the interactive computer discs. The Sara Lee company was pleased with the program and its benefits to the company in increased skills. A third-party evaluation concluded that the project had been successful and suggested improvements in recordkeeping, recruitment, and curriculum. (The documentation manual for the CD-ROM program and the third-party evaluation are included in the document.) (KC)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED353405

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

Table of Contents

Section I	Narrative report on project performance
Section II	TEXTdisc Curriculum and documentation. A reading and math basic skills program for the textile workplace. A multimedia, interactive CD-ROM disk
Section III	Evaluation Report. Third party evaluation of the Workplace Literacy System project done by Literacy South

Section I

Narrative report on performance of Workplace Literacy System Project

Final Performance Report

The Workplace Literacy System Project (WLS)

The period covered by this performance report is March 1, 1991 through September 30, 1992. The project was funded in part by a grant from the U.S. Department of Education, Office of Vocational and Adult Education, Grant number V198A1005. The project was part of a group of national demonstration projects funded by the National Workplace Literacy Program.

Partners participating in this project included: North Carolina State University, Forsyth Technical Community College and Sara Lee Knit Products Company. The project site was a Sara Lee plant in Winston Salem, North Carolina. Supporting organizations involved with this project included the North Carolina Department of Community Colleges, Raleigh, N.C.; Interactive Knowledge, Inc., Charlotte, N.C., and Literacy South, Durham, N.C.. The latter served as a third party evaluator for the project. A copy of the evaluation report submitted by Literacy South is included as part of this performance report.

Interactive Knowledge of Charlotte, N.C. was responsible for the preparation of the CD-ROM discs that contains about fifty hours of instruction and drill in basic skills presented within the context of the textile/apparel manufacturing industry. The documentation for this CD-ROM disc is included as part of this performance report.

ACCOMPLISHMENTS OF THE WLS PROJECT

Objective 1: Assess skill requirements of each major job class within the Sara Lee Knit Products' Stratford Road Plant.

The Stratford Road Plant is in a constant change mode. New product and process lines and jobs are coming on line at random intervals. However, to date Literacy Task Analyses (LTA) have been completed for all major job classes except for new printing and dyeing processes which are currently being added.

The procedure followed for conducting LTA's has evolved over time and currently proceeds as follows: For each LTA, one or more competent workers is observed performing typical job tasks for periods of 25 - 45 minutes. During the observations, the Workplace Literacy Specialist also asks the workers questions to determine how various print materials and mental processes are used on the job. The CASAS Workplace Analysis Job Profile is also used to obtain additional information on the specific basic-skill competencies required to perform the job successfully. These specific basic-skill requirements are cross-coded to the CASAS Competency List to facilitate curriculum planning. The information gathered through LTA's and the CASAS are subsequently verified by supervisors, the Senior Industrial Engineer, and the Production Manager.

The results of the observations/interviews are then documented for each job position in the two-column format and organized into a curriculum outline. An example for the job title, Compactor Operator, is included.

Literacy Task Analysis
(SLKP - Stratford Road)

Job Title: Compactor Operator **Job Grade:** 7
Department: Finishing **Audit Date:** 8/28/91

Job Summary: Independently operates a compactor/calendar at an acceptable level of quality and efficiency that steams and presses fabric to desired width and compacts fabric length to specifications (compactor only).

Job Subtasks	Basic Skills Tasks
1. Obtains fabric truck; verifies fabric to traveler checks processing requirements and pushes truck to machine	1.1 Follows procedural directions 1.2 Locates information (designated areas on form) 1.3 Reads and interprets vocational vocabulary and symbols on "traveler" 1.4 Compares/contracts (actual with specifications)

2. Prepares fabric for entry into machine by sewing end of new or by threading fabric through machine.	2. Follows procedural directions
3. Locates and positions empty unipac (box) at machine exit to catch processed fabric.	3. Follows procedural directions
4. Makes necessary set-up changes/adjustments to guides, spreaders, tension, overfeed, temperature, roll pressure, speed, and other machine controls/parts in order to process fabric to desired specs.	4.1 Reads and interprets basic switches, dials, meters, and gauges interprets increments, i.e. temperature, speed, width has knowledge of acceptable ranges 4.2 Has knowledge of equipment operating procedures 4.3 Knowledge of safety regulations 4.4 Predicts outcomes 4.5 Decision-making skills 4.6 Follows procedural directions
5. Observes fabric for tangles, tears, knots, holes, and other defects or problems repairs/removes defects which may cause damage to fabric or machine monitors appearance of fabric and operation of machinery and notifies supervisor of any bad quality or machinery malfunction.	5.1 Recognizes defects, i.e. compare/contrast, drawing conclusions 5.2 Predicts outcomes 5.3 Prioritizes actions 5.4 Decision-making 5.5 Follows sequential procedural directions
6. Checks desired properties of fabric, i.e. width and compaction, according to prescribed frequencies makes necessary adjustments to machine settings.	6.1 Reads gauges, meters (uses thread counter) has knowledge of acceptable ranges 6.2 Predicts outcomes 6.3 Decision-making 6.4 Follows sequential procedural directions 6.5 Knowledge of equipment operating procedures and safety regulations
7. Cuts samples for shading or other evaluation.	7. Follows procedural directions

8. Records appropriate information on production reporting forms, travelers, and route sheets.	8.1 Reading and writing required to identify, interpret, and record production information from traveler 8.2 Prints legibly in ink 8.3 Locates information (designated areas on form) 8.4 Must read charts and graphs for recording data 8.5 Measures cloth accurately to 1/8 inch; converts to decimals 8.6 Plots averages and range of measurement checks for every 5 merges 8.7 Records measurements, codes, stops and starts, etc. on production form (see attached)
9. Doffs machine, replaces paperwork with lots.	9. Follows procedural directions
10. Performs routine machine cleaning.	10. Follows procedural directions
11. Checks condition of safety and auxiliary equipment notifies supervisor of any problems.	11.1 Has knowledge of safety regulations 11.2 Has knowledge of equipment operating procedures 11.3 Organizes information into oral report or feedback to supervisor if problems are detected.

Objective 2: Recruit at least 300 participants and assess their individual basic skills.

Because instructional staff for this project were employed through Forsyth Technical Community College, the calendar used by FTCC was adopted for the WLP and new learners were enrolled on the quarter system. Each quarter some enrollees were continuing and many were new to the program. The enrollment by quarters was as follows:

Quarter	Number of workers enrolled
1	35
2	60
3 & 4	81
5	99
6	101
Total Enrollment	376

Individual basic skills were assessed during a registration and orientation session conducted by the Workplace Literacy Specialist. Each session was an individual three hour period. Assessment tools used included: CASAS Employability Competency System, TABE Standardized Test language arts and spelling modules, and BASE Basic Academic Skills for Employment. One or more of these assessment tools was used with each individual worker as judged appropriate. This approach allowed the development of individual educational plans for each worker and/or also supported group instructional activities.

Objective 3: Develop a customized workplace literacy curriculum for the textile industry.

A comprehensive curriculum for the textile industry is evolving from the WLP. Curriculum building activities are involved in three of the WLP instructional areas. A comprehensive curriculum provides the basis for the TEXTdisc which is a CD-ROM disc and is a reading and math program for the textile workplace. The documentation for the TEXTdisc is included with this report in Section II.

Curriculum building activities are also ongoing in our Job Enhancement Skills program which is a 150 hour program involving group instruction and required individual computer based instruction. Smaller curriculum modules are also being developed such as the curriculum for "Metric Math and Basic Skills Refresher" program which has a five week instructional effort that was required for certain groups of employees.

Objective 4: Deliver workplace literacy programs on site to employees of Sara Lee Knit Products, Stratford Road Plant.

On-site instructional programs have been operational during the 18 month period of this grant at the Stratford Road Plant. Programs have been primarily voluntary and have involved both group instruction and individualized computer-based programs. There are five different instructional programs available in-plant: a GED program requiring group instruction and computer-based instruction, a Job Enhancement Skills program involving required group instruction and computer-based instruction, a Metric Math program requiring both group instruction and computer-based instruction, the TEXTdisc program which is computer-based and the comprehensive Computer Curriculum Corp. (CCC) program which provides hundreds of hours of computer-based instruction on a course module basis.

Objective 5: Convert the customized curriculum to interactive compact disc courseware.

This courseware has been developed and is available as a CD-ROM disc. It is a multimedia/interactive program providing fifty or more hours of instruction and drill. Sound and visual support are available to the learner by icon graphical interface. Student management programs and assessment programs are included. A copy of the CD-ROM entitled TEXTdisc is included with the original copy of this performance report.

Objective 6: Evaluate the effectiveness of the Workplace Literacy System project.

A third-party evaluation of the WLP project has been done by Literacy South and this report is included in Section III of this performance report .

Objective 7: Determine the usefulness of and demand for the courseware developed through this project.

The courseware and other elements of the WLP are already being adopted by other textile plants. Attempts to assess the effectiveness of these materials at other locations are ongoing.

TARGET DATE ACCOMPLISHMENT

In general, accomplishments in this project occurred in a time frame envisioned by their planned target dates. The only serious slippage was with the production of the CD-ROM disc. This process was delayed because the large hard disk storage equipment failed and most of the reading modules were lost. All of this data had to be reconstructed in order to proceed with the production of the CD-ROM.

NUMBER AND CHARACTERISTICS OF PROGRAM PARTICIPANTS

As previously noted in this report, total worker enrollment for this project was 376. Complete records on all 376 of these enrolled are not available because data were not collected and recorded during the early stages of this project for those workers who made exclusive use of computer-based instruction. A sub-group of 239 participants provides characteristic profiles that are valid examples of the entire group of participants in the WLP.

Distribution of characteristics of a group of 239 participants in WPL:

Gender	Male -107	Female - 98	NA - 34			
Age	19-25 (24)	26-35 (79)	36-50 (65)	51-65(26)	NA (45)	
Race	Wh -108	Bl - 80	Ind -1	Hisp -3	Asian -1	NA -46
Years Employed at SLKP	-1 (19)	1-2 (4)	3-5 (52)	6-10 (24)	10+ (68)	NA (72)

NA - data not available

Outcomes achieved by those participating in WLP were varied. Measures included techniques such as interviews, writing samples, standardized tests, instructor supervised exercises and testing by computer exams.

The GED program, of course, required students to take the standardized GED examinations. Twenty students have earned the GED following enrollment in the WLP. The Job Enhancement Skills (JES) program requires a student to achieve a score of 80 percent in a series of BASE tests in order to satisfactorily complete the JES program. The Metric Math program includes an instructor supervised hands-on practicum during the final week. During the practicum, students are required to make actual measurements of cloth and prepare graphs and forms. Students enrolled in the computer-based CCC curriculum are required to achieve a score of 80 percent to satisfactorily pass a course module.

In considering program outcomes, benefits to the Company are a secondary concern. Indeed some argue that the improved skills of the workforce are the overarching benefit to the Company. The WLP has not made any systematic effort to assess benefits to the Company beyond the improved skills of the workforce.

The Company, Sara Lee Knit Products, does, however, communicate its strong interest and support for the WLP in a number of ways. For example, when the need arose to establish a new department in the plant (Printing Department), the department manager requested a list of those plant workers who had satisfactorily completed one of the WLP programs. The staff for the new department was selected from the list. Another example of how SLKP values the WLP is the Metric Measurement course. This was requested of WLP by the Company in an effort to reduce waste from measurement errors. It has proven a very successful venture.

DISSEMINATION ACTIVITIES

The WLP program, its structure, its goals, its methodology and its accomplishments has been presented at various meetings within SLKP and at outside meetings. Early in 1992, SLKP brought together its plant managers, human resource directors and others for an all-day meeting at the Stratford Plant

so that the WLP staff could provide an in-depth briefing on how to establish a similar program at other SLKP plants. This has been followed by additional meetings for those from individual plants wanting to duplicate the WLP.

The Workplace Literacy Specialist has made presentations at other community colleges and at the statewide meeting for Basic Skills Educators held in Fayetteville, N.C., in August 1992. This conference was sponsored by the North Carolina Department of Community Colleges. At the 1992 North Carolina Community College Adult Educators Association meeting held November 4-6 at Greensboro, N.C., both the WLP program was presented and the TEXTdisc was demonstrated.

Individual efforts are underway with several other community colleges and textile manufacturers to install the TEXTdisc at workplace sites.

Press releases about the availability of the TEXTdisc courseware have been sent throughout North Carolina. The courseware is being utilized in South Carolina in conjunction with Clemson University. Textile trade organizations will carry information about TEXTdisc courseware as soon as preparations for general release and distribution are complete.

EVALUATION ACTIVITIES

An in-depth third party evaluation of the WLP project has been conducted by Literacy South and a copy of their report is included in the final performance report.

Evaluation of the TEXTdisc courseware will be made by educators using the courseware in their programs. Literacy South will do a third party evaluation of the courseware over the next year.

Investigations are now underway to discover assessment techniques that will measure the transfer of knowledge from the WLP to learners enrolled in the program.

Section II

TEXTdisc curriculum and documentation.
A reading and math basic skills program for the textile workplace.

Available as a multimedia, interactive CD-ROM disc.

TEXTdisc Draft Documentation

The attached documents are part of the draft documentation being produced to accompany The TEXTdisc multimedia instructional software. The following materials are included:

- **The TEXTdisc Overview**
- **Student Handouts for each of the five articles included in The TEXTdisc reading section. The handouts feature:**

  1. **The 4-paragraph article describing one phase of the textile production process**
  2. **Reading goals**
  3. **Vocabulary words and their definitions**
  4. **True/False questions**
  5. **Fill-in-the-blank questions**

The TEXTdisc

A Reading and Math Disc for the Textile Workplace

Overview

The TEXTdisc is a CD-ROM disc containing multimedia workplace literacy courseware. It is designed to help textile employees improve their reading and math skills.

A videotape companion provides an introduction to The TEXTdisc and is designed to motivate employees to complete the program.

The TEXTdisc CD-ROM courseware is developed around textile industry content and has a reading component as well as a math component. In both tracks, activities are designed to help employees develop the critical thinking skills necessary to be better prepared for changes in the workplace.

The TEXTdisc courseware is designed to give the employee control of the learning experience. The courseware is for any employee who is functioning at or above a fifth-grade reading level and has some knowledge of basic math.

Highlights

- Basic reading and math skills instruction using content relevant to the textile industry and the workforce.
- Critical thinking skills introduced throughout both the reading and math components.
- High-quality digital audio, full-color digitized photographs and animation to enhance the instruction.
- Student management component records student scores and time on task.

Instructional Outline

Video Introduction to the Courseware

A short videotape (5 - 8 mins.) provides an introduction to the program. The tape is a motivational piece on learning (importance of learning, new ways to learn with computer, etc.). It also introduces each instructional module and describes the components that make up the courseware. Following is a brief outline of the videotape.

- motivation for learning
  - why developing better basic skills is important
  - how computer can help you improve skills quickly

- overview of each module topic
  - introduce each module topic in a short, promotional format
  - incorporate a descriptive graphic image that will be used as a symbol in the courseware menus

- introduction to the courseware
  - explanation of the reading and math components
  - explanation of each skill, why it is important

Reading Component

The reading component is designed to help textile employees develop reading comprehension skills and increase their vocabulary. This section of the instruction contains five modules describing the textile industry process. Following is a list of the five module titles included on The TEXTdisc:

1. Preparing Cotton Fibers for Spinning
2. Spinning of Wool and Cotton Yarn
3. Knitting Fabric
4. Weaving Fabric
5. Fabric Finishing and Color Application

A short article (4 paragraphs) introduces each topic and is used throughout the module to teach a variety of important reading comprehension skills. Each reading module provides instruction on 5 reading steps:

Reading Module Outline

Step 1 - Before you read the article

Activity 1 - Think about what you want to learn from the article

Step 2 - Reading the article

Activity 1 - Read the article
Activity 2 - Learn about the vocabulary words
Activity 3 - Take the vocabulary test

Step 3 - Understanding the article

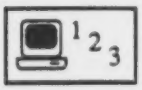
Activity 1 - Identify paragraph topics
Activity 2 - Make an outline
Activity 3 - Identify where to look for answers

Step 4 - Finding information in the article

Activity 1 - Scan for words
Activity 2 - Scan for answers
Activity 3 - Scan for more answers (first level inference)

Step 5 - After you read the article - what have you learned?

Activity 1 - Summarize the article
Activity 2 - Answer true / false questions
Activity 3 - Answer fill-in-the-blank questions
Activity 4 - Answer questions from Step 1



Math Component

The math component consists of 4 levels of word problems dealing with specific math skills. This section of the courseware deals with the application of known math and critical thinking skills to problems a textile employee would find on the job or in every day life. Each level is broken down into 3 or 4 programs covering whole numbers, fractions, decimals, and percents. Each program includes problems which review skills from previous levels.

The courseware includes a placement test to determine where in the math module the employee should begin. The word problems in the math component are tied in with instruction in workbooks.

There are over 400 word problems in the math component covering a variety of textile job-specific issues and everyday situations.

Math Component Outline

Level A - Whole numbers - Word Problems

Program 1 • Adding whole numbers (object numbers, money numbers, carrying)
Program 2 • Subtracting whole numbers (borrowing, money)
Program 3 • Multiplying whole numbers (carrying)
Program 4 • Dividing whole numbers (remainders)

Level B - Fractions - Word Problems

Program 1 • Adding fractions (same denominator, different denominator, mixed numbers)
Program 2 • Subtracting fractions (same and different denominator, mixed numbers, borrowing with same and different denominator)
Program 3 • Multiplying fractions (mixed numbers)
Program 4 • Dividing fractions (mixed numbers)

Level C - Decimals - Word Problems

Program 1 • Add, subtract, multiply, divide decimals
Program 2 • Add, subtract, multiply, divide decimals (problems require changing a fraction to a decimal)
Program 3 • Add, subtract, multiply, divide decimals (problems that require rounding off decimals)

Level D - Percents - Word Problems

Program 1	• Find part when percent and whole are known (What is 10% of 50?)
Program 2	• Find percent when part and whole are known (What % of 50 is 5?)
Program 3	• Find whole when percent and part are known (5 is 10% of what number?)

For more information, contact:

Literacy Systems Center
North Carolina State University
246 McKimmon Center
Raleigh, NC 27695-7401
(919) 515-7982

Interactive Knowledge, Inc.
P.O. Box 560865
Charlotte, NC 28256
(704) 549-9646

The TEXTdisc - Module 1
Preparing Cotton Fibers for Spinning

Article for Module 1

The making of yarn begins in the opening, cleaning, and blending area of a yarn plant. If the finished yarn is to be of uniform quality, cotton from various sources must be blended together. To do this, fibers from several bales are fed into a machine that blends the fibers and opens or separates them into a loose fluffy mass. During the opening and blending process, many impurities such as dirt and seeds are removed by agitation and sifting.

A carding machine continues the fluffing and cleaning process, and also partially aligns the fibers so that they lie somewhat parallel. Carding is done by wire pins that are attached to a moving cylinder. A filmy layer of carded fibers collects on the cylinder. This is gathered into a soft mass that is pulled into a ropelike strand of fibers about one inch in diameter called a card sliver.

Card slivers then go through the drawing frame to make the quality of the slivers more uniform. Rollers smooth and mix several slivers at a time, pull them into a thin layer, and then into a drawn sliver. This is also the process that blends fibers of different types when blended yarn is wanted. For example, if a 50/50 polyester / cotton blend yarn it to be made, cotton slivers would be mixed with an equal number of polyester slivers.

Drawn slivers are taken to the roving frame and fed between sets of rollers. Each set of rollers rotates faster than the set behind it. The difference in rotation speed causes the strand that comes out of the roving frame to be about one-eighth the diameter of the drawn sliver that went in. A little twist is added, and this new strand, called roving, is wound on a bobbin. The bobbins are doffed, or removed, and taken to the spinning frame.

NOTE - underlined words are hypertext vocabulary words

Reading goal for Module 1 - answer these questions:

1. How are dirt and seeds cleaned from cotton?

2. What does a carding machine do?

3. What are slivers and roving?

4. What does a drawing frame do?

5. What does a roving frame do?

Vocabualry Words
Module 1 - Preparing Cotton Fibers for Spinning

A. Story dictionary (hypertext words in the story)

** graphic or photograph available for this word*

agitation (aj i TA shun) - shaking or moving back and forth

aligns (u LINZ) - forms into a line or makes things lie pointing in the same direction

area (AR i u) - a space used for a special function or purpose

attached (u TACHT) - joined or fastened to something else

bales (balz) - from the word bale. A bale is a large bundle of a material such as cotton that is tightly wrapped for shipping or storage.

blending (BLEND ing) - thoroughly mixing two or more things together

blends (blendz) - From the word blend. Blend means to thoroughly mix two or more things together.

bobbin* (BOB in) - a reel or spool for holding thread or yarn used in spinning, weaving, or sewing

card sliver* (kahrd SLI ver) - the strand that comes out of the carding machine

card slivers* (kahrd SLI verz) - the strands that come out of the carding machine

carding machine* (KAHRD ing mu SHEN) - a machine that fluffs and cleans cotton, and makes the cotton fibers start to line up

causes (KO zez) - makes happen

collects (ku LEKTS) - gathers together or accumulates

continues (kon TIN uz) - keeps on

cylinder* (SIL in der) - a long, round object with flat ends

diameter* (di AM e ter) - the straight line passing from one side to the other through the center of a circle

difference (DIF er ens) - the way in which things are not alike

different (DIF er rent) - not the same

doffed (doft) - taken off

drawing frame* (DRAW ing fram) - a machine that mixes together and smoothes card slivers and makes them into drawn slivers

drawn sliver* (drawn SLI ver) - the strand that comes out of the drawing frame

drawn slivers* (drawn SLI verz) - the strands that come out of the drawing frame

equal (E kwul) - the same

example (eg ZAM pul) - one thing selected to show what others are like

fibers* (FI berz) - the tiny, threadlike parts of which cotton is made

filmy (FIL me) - very thin or sheer

fluffy (FLUF e) - soft and light

fluffing (FLUF ing) - shaking or puffing out into a soft, light, downy mass

gathered (GATH erd) - collected together

impurities (im PYUR i tez) - unwanted things that are mixed with the thing that is wanted

loose (loos) - not tightly packed

machine (mu SHEN) - something made to do work

parallel* (PAR u lel) - side by side, lying in the same direction

partially (PAHR shul le) - not completely

polyester (pol e ES ter) - a man-made fiber from which some fabrics are made

process (PROS es) - a set series of things that lead to an expected result

quality (KWOL i te) - worth or value

removed (re MOOVED) - gotten rid of or taken away

rotates (RO tats) - turns in a circle

rotation (ro TA shun) - turning in a circle

roving* (ROV ing) - the strand that comes out of the roving frame

roving frame* (ROV ing fram) - a machine with many rollers, that changes drawn slivers into smaller strands called roving

separates (SEP u rats) - takes apart or comes apart

several (SEV er ul) - more than two or three but not many

sifting (SIFT ing) - separating smaller pieces from larger pieces by allowing the smaller pieces to fall through holes

slivers (SLI verz) - from the word sliver. A sliver is a ropelike strand of fibers that is about an inch in diameter.

smooth (smooth) - to give an even surface to something

sources (SORS ez) - the places from which something is gotten

strand (strand) - a single stringlike piece of something

through (throo) - into one side of something and out the other side

together (too GETH er) - with each other

twist (twist) - turn

types (tips) - kinds

uniform (U ni form) - always the same and unchanging

various (VAR i us) - many, or several of different kinds

wound (wound) - rolled into a ball or onto a spool or bobbin

B. Vocabulary exercise words (test words)

agitate	rotate
align	seperate
attach	sift
blend	sourse
cause	strand
equal	through
filmy	type
impurity	uniform
partial	various
process	
quality	

True / False Questions
Module 1 - Preparing Cotton Fibers for Spinning

(The questions will be presented in a random order to the student)

True Statements:

1. Cotton from various sources are blended together so the finished yarn will be of more uniform quality.
2. Many impurities are removed by agitation and sifting in the opening and blending process.
3. Fibers are partially aligned in the carding machine.
4. Carding is done by wire pins that are attached to a moving cylinder.
5. Slivers are made more uniform in the drawing frame by forming a new sliver from several card slivers that have been mixed together.
6. For a blended yarn, fibers of different types are mixed together in the drawing frame.
7. A 50/50 polyester/cotton blend yarn is made by mixing an equal number of cotton slivers and polyester slivers.
8. The diameter of roving is about 1/8 the diameter of a drawn sliver.
9. Sets of rotating rollers reduce the diameter of the drawn sliver that is fed into the roving frame.
10. Roving is wound on bobbins and taken to the spinning frame.

False Statements:

1. After being wound on bobbins, roving is taken to the drawing frame.
2. Polyester slivers and cotton slivers are blended together by the carding machine.
3. Carding is done by wire pins on a moving cylinder in the roving frame.
4. Roving is formed from drawn slivers by agitation and sifting.
5. Cotton from different sources is never mixed together.

Fill-in-the-Blank Questions
Module 1 - Preparing Cotton Fibers for Spinning

1. The strand coming from the carding machine is called a card sliver.
2. The strand coming from the drawing frame is a drawn sliver.
3. The strand produced by the roving frame is roving.
4. Sets of rollers rotating a different speeds are found in the roving frame.
5. A moving cylinder with wire pins attached is found in a carding machine.
6. Fibers from bales from various sources are mixed together in the opening and blending process.
7. Several slivers are smoothed and mixed together in the drawing frame.
8. For a blended yarn, fibers of different types are mixed together by the drawing frame.
9. The diameter of roving is much smaller than the diameter of a drawn sliver.
10. Many impurities are removed by agitation and sifting in the opening and blending process.

The TEXTdisc - Module 2
Spinning of Wool and Cotton Yarn

Article for Module 2

The simplest yarn structure is called single yarn. This is yarn composed of short staple fibers with sufficient twist to hold together. The final process in the preparation of single yarn is spinning. Spinning of yarn may be by a system called ring spinning or by a newer procedure called open-end spinning. With either process the desired result is to produce a yarn that has a specific diameter, strength, and twist and is uniform in quality.

Ring spinning begins with roving being fed between sets of rotating rollers that are similar to those in a roving frame. The rollers further extend the roving to the desired diameter. The yarn is carried to a bobbin by a U-shaped guide, called a traveler, which moves around the bobbin on a ring. As the yarn is wound, a twist is added by the turning of the spindle which holds the bobbin and by the movement of the traveler.

In open-end spinning, a sliver of fibers is fed into a machine in which air blows the fibers into a loose form. Individual fibers are then pulled to constantly add to the open end, or tail, of the forming yarn. The yarn is extended to the appropriate diameter. A twist is added, and the finished yarn is wound onto a bobbin. Open-end spinning is faster than ring spinning, and labor costs and energy consumption are reduced.

Although cotton yarn can be spun by ring spinning or open-end spinning, wool yarn is made primarily on ring spinning frames. Prior to spinning, wool fibers require some special procedures. Each fleece must first be pulled apart and the fibers sorted according to fineness and length. The wool is then washed to remove grease, dirt, and dust. The wool fibers are carded and the resulting roving goes to the spinning frame to be extended and twisted.

NOTE - underlined words are hypertext vocabulary words

Reading goal for Module 2 - answer these questions:

1. How is yarn made by open-end spinning?
2. How is yarn made by ring-spinning?
3. How is wool yarn made?
4. What qualities are wanted when yarn is spun?
5. Why is open-end spinning cheaper to do than ring-spinning?

Vocabulary Words
Module 2 - Spinning of Wool & Cotton Fibers

A. Story dictionary (hypertext words in the story)

** graphic or photograph available for this word*

according (a KOR ding) - in agreement with

although (awl THO) - in spite of the fact; even though

appropriate (u PRO pri it) - correct or proper

bobbin* (BOB in) - a reel or spool for holding thread or yarn used in spinning, weaving, or sewing

carded (KAHR ded) - cleaned or combed with wire brushes. Tangles and impurities are removed, and the wool fibers come out of the carding machine in a ropelike form called roving.

composed (kom POZD) - made up

constantly (KON stant le) - without stopping

consumption (kon SUMP shun) - the amount used up

desired (de ZIRD) - wanted, wished for strongly

energy (EN er je) - ability to do work. When we talk about energy consumption in spinning yarn, we mean fuels used to provide electricity to make the machines work.

extend (ek STEND) - to stretch out, or draw out, or become longer

extended (ek STEN ded) - stretched out, or drawn out, or made longer

final (FI nul) - last, or at the end

fleece (fles) - wool that has been cut from a sheep

further (FER ther) - to a greater extent, or more

grease (gres) - the oily matter in wool

individual (in di VIJ u ul) - single or separate

labor costs (la ber kosts) - the money paid to workers to do the job

length (length) - how long a thing is

preparation (prep u RA shun) - the things done to make something

primarily (pri MAR i le) - chiefly or usually

prior (PRI or) - coming before in time

procedure (pro SE jur) - the way or method of doing something

produce (pro DOOS) - to make

reduced (re DOOST) - comes from the word reduce, which means to make the amount smaller

remove (re MOOV) - to take away

require (re KWIR) - to have need for or make necessary

result (re ZULT) - what is caused by some action

resulting (re ZULT ing) - what was caused by some action

rotating (RO tat ing) - turning in a circle

roving* (ROV ing) - a ropelike strand of fiber, smaller in diameter than a sliver, that is ready to go into a spinning frame

similar (SIM i ler) - alike without being exactly the same

simplest (SIM plest) - the plainest and least complicated

sliver* (SLI ver) - a ropelike strand of fibers that is about an inch in diameter

sorted (SORT ed) - arranged or divided by kinds

special (SPESH ul) - a particular kind, different from others

specific (spi SI fik) - exact or of a definite kind

spindle (SPIN dul) - a rod which holds a bobbin on a spinning frame

staple fibers (STA pul FI berz) - tiny, threadlike parts of which cotton and wool are made

strength (strength) - being strong

structure (STRUK cher) - the way parts are put together

sufficient (su FISH unt) - enough or as much as is needed

system (SIS tem) - a plan or a method

traveler* (TRAV ler) - a U-shaped guide on a spinning frame that moves around the bobbin and guides yarn onto the bobbin

twisted (TWIS ted) - turned, or wound together

U-shaped guide (U shapt gid) - a part on a spinning frame that carries or directs yarn to the bobbin. It is called "U-shaped" because it is shaped like the letter "U".

B. Vocabulary exercises words (test words)

according	produce
appropriate	reduce
compose	require
constant	result
consumption	similar
extend	simple
preparation	specific
primary	structure
prior	sufficient
procedure	system

True / False Questions
Module 2 - Spinning of Wool and Cotton Yarn

(The questions will be presented in a random order to the student)

True Statements:

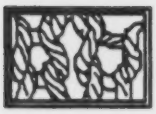
1. Open-end spinning is a newer system for spinning yarn than is ring spinning.
2. Cotton yarn can be spun by ring spinning or open-end spinning.
3. Wool yarn is usually spun by ring spinning.
4. In ring spinning, roving is extended to the desired diameter by sets of rotating rollers.
5. In ring spinning, the untwisted yarn is carried to the bobbin by a U-shaped guide called a traveler.
6. In ring spinning, twist is added to the yarn as it is wound on a bobbin.
7. Open-end spinning gets its name because loose fibers are pulled to the end of the forming yarn.
8. Open-end spinning uses less energy than ring spinning.
9. Open-end spinning is faster than ring spinning.
10. Prior to spinning, wool yarn is sorted, washed, and carded.

False Statements:

1. Wool fibers are prepared for spinning the same as cotton fibers.
2. In ring spinning, labor costs and energy consumption are reduced.
3. Grease, dirt, and dust are removed from wool fibers by the spinning frame.
4. In open-end spinning, twist is added to the yarn by the bobbin.
5. Single yarn is yarn with no twist added.

Fill-in-the-Blank Questions
Module 2 - Spinning of Wool and Cotton Yarn

1. The simplest yarn structure is called single yarn.
2. Wool yarn is usually spun by ring spinning.
3. The system of spinning in which loose fibers are added to the tail of forming yarn is called open-end spinning.
4. In ring spinning, the yarn guide that moves around the bobbin on a ring is a traveler.
5. The spinning system that is cheapest to operate is open-end spinning.
6. The older system of spinning is ring spinning.
7. Finished yarn is wound on a bobbin.
8. Roving is extended in ring spinning by a rotating roller.
9. The U-shaped guide that carries yarn in ring spinning is called a traveler.
10. In ring spinning, the bobbin is held by a spindle.



The TEXTdisc - Module 3
Knitting Fabric

Article for Module 3

Knitting is a system in which fabric is formed by using thin pointed needles to interloop yarns. Fabric has been made this way for over seventeen centuries. Through the use of modern knitting machines, knits can now be made rapidly and at a comparatively low cost. Weft knitting and warp knitting are the two general methods used in making knit fabric.

Weft knit fabric is made by forming yarn loops across the width of the fabric. It is usually done on a circular machine with the finished fabric in the shape of a tube. However, some weft knitting is done on a flatbed machine. Four kinds of stitches can be formed, but the most often used is the plain or jersey knit used in t-shirts. Weft knit fabrics may be single-knit (formed by using one set of needles) or double-knit (formed by using two sets of needles).

A warp knit fabric is always flat and has straight side edges. It is formed by loops of yarn going down the fabric instead of across the width or around in a circle. Machines used for warp knitting are similar in appearance to weaving machines and are sometimes called knitting looms. Warp knit fabric can be manufactured rapidly and in large quantities.

Warp knit fabric can be classified as tricot, raschel, and simplex. Tricot and raschel are the most common types. Tricot knits may be sheer and filmy as used for lingerie or firm and more opaque as used for blouses. Raschel knitting offers great flexibility in design and is important in making highly patterned knit fabric and crochet knits.

NOTE - underlined words are hypertext vocabulary words

Reading goal for Module 3 - answer these questions:

1. What is the difference between weft knit and warp knit fabric?
2. On what kind of machine is weft knitting done?
3. On what kind of machine is warp knitting done?
4. What is a common kind of weft knit fabric?
5. What are the most common kinds of warp knit fabrics?

Vocabulary Words
Module 3 - Knitting Fabrics

A. Story dictionary (hypertext words in the story)

** graphic or photograph available for this word*

appearance (u PIR uns) - the outward look of something or someone.

blouses (BLOUS ez) - a kind of shirt worn by women

centuries (SEN chu riz) - from the word century. A century is 100 years.

circle (SER kul) - a perfectly round shape

circular* (SER ku lahr) - revolving, or moving in a circle

classified (KLAS i fid) - grouped according to kind

common (KOM un) - usual or widespread

comparatively (kom PAR u tiv le) - measured by comparison with something else

crochet* (kro SHA) - a kind of knit fabric made by raschel knitting

design (de ZIN) - an outline, drawing or plan of something that is to be made or done

edges (EJ ez) - the sides

fabric* (FAB rik) - woven or knit cloth

flatbed machine* (flat bed mu SHEN) - a machine used for some weft knitting such as for knitting specific shapes or for producing "full-fashioned" knit pieces

flexibility (flek su BIL i te) - ability to adapt easily

general (JEN er ul) - widespread or common

interloop (in ter LOOP) - to loop together

jersey knit* (JER ze nit) - a type of knitting often used for t-shirts

knitting looms (nit ting loomz) - machines used for warp knitting

lingerie (lahn ju RA) - women's underwear

machines (mu SHENZ) - things made to do work

manufactured (man u FAK cherd) - made by hand or in a factory, usually in large numbers

methods (METH ods) - a regular way or system of doing something

modern (MOD ern) - of the present time

needles* (NE dulz) - small thin pieces of metal used to hold thread or yarn for sewing or knitting

opaque (o PAK) - cannot be seen through

patterned (PAT ernd) - has designs or figures

pointed (POIN ted) - sharp

quantities (KWON ti tez) - amounts

rapidly (RAP id le) - fast or quickly

raschel* (ru SHEL) - a method of warp knitting

seventeen (se ven TEN) - the number 17

sheer (sher) - very thin

similar (SIM i ler) - alike, without being exactly the same

simplex (SIM pleks) - a method of warp knitting

stitches (STICH ez) - ways of making interloops in knitting

straight (strat) - without bends or curves

tricot* (TRE ko) - a method of warp knitting

tube (tub) - a hollow cylinder

usually (U zu ul le) - ordinarily or most of the time

warp (wahrp) - a method of knitting fabric in which the loops formed by the yarn go down the length of the fabric

weaving (WEV ing) - making fabric by interlacing sets of yarn

weft (weft) - a method of knitting fabric in which the loops formed by the yarn go across the width of the fabric or around a circle

width (width) - the space from side to side

B. Vocabulary exercise words (test words)

appearance	manufacture
century	method
circular	modern
classify	opaque
common	pattern
comparative	quality
design	rapid
fabric	sheer
flexible	usual
general	width

True / False Questions
Module 3 - Knitting Fabric

(The questions will be presented in a random order to the student)

True Statements:

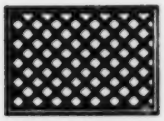
1. In weft knitting, the yarn loops are formed across the width of the fabric.
2. A warp knit fabric always has straight side edges and lies flat.
3. The most common weft knit stitch is the jersey knit.
4. Double-knit fabrics are formed by using two sets of needles.
5. Machines for warp knitting look like weaving machines and are called knitting looms.
6. If the yarn loops are formed going down the length of the fabric, it is warp knit.
7. Finished weft knit fabric may be in the shape of a tube.
8. Tricot and raschel are the most common types of warp knit fabrics.
9. Although most weft knitting is done on a circular machine, some is done on a flatbed machine.

False Statements:

1. Fabric has been made by knitting only since the 17th century.
2. Yarn loops are formed going down the fabric in weft knitting.
3. Finished warp knit fabric is often in the shape of a tube.
4. Warp knit fabrics are usually done on a circular machine.
5. Single-knit and double-knit are the most often used stitches in weft knitting.
6. Simplex is the most common type of warp knit fabric.

Fill-in-the-Blank Questions
Module 3 - Knitting Fabric

1. In knitting, fabric is formed by using needles to interloop yarn.
2. Yarn loops are formed across the width of the fabric in the method of knitting called weft knitting.
3. Finished fabric in the shape of a tube is done on a circular machine.
4. Some, but not most, weft knitting is done on a flatbed machine.
5. A common kind of weft knit fabric is jersey knit.
6. The method of knitting in which yarn loops are formed going down the length of the fabric is warp knitting.
7. The machine used in warp knitting is called a knitting loom.
8. The warp knitting method produces fabric that is always flat and has straight side edges.
9. A fabric often used for lingerie because it is sheer and filmy is tricot.
10. A type of warp knit fabric noted for its flexibility in design is raschel.



The TEXTdisc - Module 4
Weaving Fabric

Article for Module 4

Weaving is one of the oldest art forms known. Woven fabric of fine quality has been found in some of the oldest tombs discovered. Woven fabric consists of sets of yarns interlaced at right angles to each other. Different weaves are achieved by altering the pattern by which the yarns are interlaced. By changing the type of yarn used and the tightness of the weave, each weave can produce a variety of fabrics.

Weaving is done on a loom. A beam located at the back of the loom holds the warp (lengthwise) yarn and releases yarn to the weaving area of the loom as needed. In the weaving area of the loom, the filling or weft (crosswise) yarns are interlaced with the warp. Until recent years, all looms used a shuttle to place the filling yarn. Looms without shuttles have now replaced many of the shuttle looms.

Shuttleless looms include three principal types. These are the projectile weaving machine, the rapier weaving machine, and the jet weaving machine. The projectile machine uses a small metal unit that grips the filling yarn and carries it across the loom. Rapier weaving machines use metal arms to carry the yarn. Jet weaving looms lay the filling yarns by either a jet of air or a jet of water.

There are three basic weaves from which most woven fabrics are made. The plain weave is the simplest and cheapest to produce. An example is the fabric from which most bed sheets are made. Another basic weave is the twill weave, which is characterized by raised diagonal lines. Twill fabrics usually are strong and durable, and denim is an example. Satin weave fabrics are smooth and shiny on tip. Coat linings are often made of a satin weave fabric.

NOTE - underlined words are hypertext vocabulary words

Reading goal for Module 4 - answer these questions:

1. What does a shuttle do on a loom?
2. What are the main kinds of looms without a shuttle?
3. Which weaves are the most common?
4. How can you make different kinds of fabric using the same weave?
5. How is cloth formed by weaving?

Vocabulary Words
Module 4 - Weaving Fabrics

A. Story dictionary (hypertext words in the story)

** graphic or photograph available for this word*

achieved (u CHEVD) - got done, or was successful at doing

altering (AWL ter ing) - changing, or making different

angles* (ANG gulz) - from the word angle. An angle is the space between two lines or surfaces that meet. A right angle is an angle that looks like the corner of a square.

area (A re u) - space

basic (BA sik) - main or fundamental

beam* (bem) - part of a loom

characterized (KAR ik tu rizd) - described the special qualities of a person or thing

cheapest (CHEP est) - costing the least

consists (kon SISTS) - is formed, or made up

crosswise* (KROS wiz) - in the direction from side to side. Weft yarn goes across the width of the fabric.

diagonal* (di AG u nul) - a straight line that goes across in a slanting direction

discovered (dis KUV erd) - seen for the first time, or found out

durable (DUR u bul) - capable of lasting a long time

example (eg ZAM pul) - one selected to show what others are like

fabric* (FAB rik) - woven or knit cloth

fabrics (FAB riks) - woven or knit cloths

include (in KLOOD) - to contain as part of a whole

interlaced (in ter LAST) - joined by weaving together

jet weaving machine (jet WE ving mu SHEN) - a kind of shuttleless loom

known (non) - to be informed of

lengthwise* (LENGTH wiz) - in the direction from end to end. Warp yarn goes the

length of the fabric.

located (LO kat ed) - established in a place

loom (loom) - machine on which cloth is woven

pattern (PAT ern) - arrangement

plain weave* (plan wev) - type of basic weave

principal (PRIN si pul) - most important, or main

produce (pro DOOS) - make, or manufacture

projectile (pro JEK til) - an object that can be thrown or shot forward. A <u>projectile weaving machine</u> is a kind of shuttleless loom.

quality (KWOL i te) - worth or value

rapier weaving machine (RA pi er WE ving mu SHEN) - a kind of shuttleless loom

recent (RE sent) - not long past, or modern

releases (ri LES ez) - lets go

replaced (ri PLAST) - took the place of

satin weave* (SA tin wev) - type of basic weave

sets (sets) - from the word set. A set is a number of things belonging together.

shuttle (SHUT ul) - the part on older looms that places the filling or weft yarn.

shuttleless (SHUT ul les) - without a shuttle

simplest (SIM plest) - the easiest to do

smooth (smooth) - has an even surface

twill weave* (twil wev) - type of basic weave

types (tips) - kinds

unit (U nit) - one of anything, or a group of things thought of as being together in one whole

variety (vu RI i te) - a number of different kinds

weaves (wevz) - patterns by which sets of yarn are interlaced to form fabric

weaving (WE ving) - making fabric by interlacing sets of yarns

woven (WOV en) - made by interlacing sets of yarn

B. Vocabulary exercise words (test words)

achieve	example
alter	include
angle	locate
area	principal
basic	projectile
characterize	recent
cheap	release
consist	replace
discover	set
durable	variety

True / False Questions
Module 4 - Weaving Fabric

(The questions will be presented in a random order to the student)

True Statements:

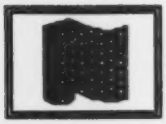
1. Woven fabric has been found in some of the oldest tombs discovered.
2. By changing the interlacing pattern you can get different weaves.
3. A weave can be made to look different by changing the yarn or tightness.
4. The warp (or lengthwise) yarn is held and released by the beam.
5. The filling (or crosswise) yarn is interlaced with the warp yarn.
6. All filling yarn used to be placed by a shuttle.
7. Projectile, rapier, and jet weaving machines do not have a shuttle.
8. The three basic weaves are plain weave, twill weave, and satin weave.
9. The simplest and cheapest weave to produce is the plain weave.

False Statements:

1. Projectile weaving machines use a shuttle to place the filling yarn.
2. Weaving was first begun about 200 years ago.
3. The most modern looms use a shuttle to place the filling yarn.
4. The twill weaves are always smooth and shiny on top.
5. A beam grips the filling yarn and carries it across the loom.
6. Denim is an example of a fabric made by the plain weave.

Fill-in-the-Blank Questions
Module 4 - Weaving Fabric

1. Different weaves are gotten by changing the pattern by which the yarn is interlaced.
2. Yarn going down the length of the fabric is called the warp yarn.
3. Yarn going across the fabric is called the filling yarn.
4. A shuttle was used to place the yarn on looms until recent years.
5. A small metal unit places the filling yarn in a projectile weaving machine.
6. Metal arms carry and place the filling yarn in a rapier weaving machine.
7. A jet of air or water place the filling yarn in a jet weaving machine.
8. The cheapest and simplest fabric to make is the plain weave.
9. Satin weave fabrics are smooth and shiny on top.
10. Denim is an example of a twill weave fabric.



The TEXTdisc - Module 5
Fabric Finishing and Color Application

Article for Module 5

Unfinished fabrics just off the loom or knitting machine are called greige or gray goods. Before reaching the consumer market, most fabrics will receive one or more finishing treatments. The amount of finishing is determined by the type of fabric and the purpose for which it is intended. Finishes may be mechanical, and applied by equipment; or they may be chemical, and applied through the use of a water bath, foam application, or a solvent.

Some finishes are called routine finishes and are usually a part of the preparation of all fabrics. Protruding ends of fibers are removed by singeing, and desizing removes chemicals applied earlier. Fabrics are bleached or scoured to prepare for dyeing or printing or to make them white. Machines straighten the fabric and make the width uniform. Pressure and heat remove wrinkles and give the fabric a smooth surface.

There are also finishes designed to alter the fabric. Heat and pressure can be used to give fabric a raised design or a polished surface. Fabric can be napped by passing it over wire brushes to create fluff, such as the inside of a sweatshirt. Chemicals may be applied that make the fabric softer or stiffer, wrinkle less, be flame resistant, repel water or soil, or be less likely to shrink or fade.

Although dye can be applied at the fiber, sliver, or yarn stage, most solid color fabric is dyed after the fabric has been constructed. This is called piece dyeing. The process takes several hours, and steps include the application of dye, a chemical bath, steaming, washing, and drying. If a printed design on the surface of the fabric is desired, techniques such as resist printing, discharge printing, and direct printing are used.

NOTE - underlined words are hypertext vocabulary words

Reading goal for Module 5 - answer these questions:

1. When and how is solid color fabric usually dyed?
2. How is a printed design put on fabric?
3. What routine finishing treatments are done to most fabrics?
4. What are some special finishing treatments that use chemicals?
5. What are some special finishing treatments that do not use chemicals?

Vocabulary Words
Module 5 - Fabric Finishing and Color Application

A. Story dictionary (hypertext words in the story)

** graphic or photograph available for this word*

alter (AWL ter) - change, or make different

although (awl THO) - in spite of the fact that

amount (u MOUNT) - the total, or quantity

application (ap li KA shun) - the act of putting on, or the thing that is put on

applied (u PLID) - put or laid on

bleached (blecht) - whitened by the use of chemicals

chemical (KEM i kul) - substance such as acid, bleach or alcohol

chemicals (KEM i kulz) - substances such as acids, bleaches and alcohol

constructed (kon STRUK ted) - put together (in the case of fabric, knit or woven)

consumer (kon SOO mer) - a person who buys and uses food, clothing, services, and other products

create (kre AT) - to make, or cause to be

designed (de ZIND) - planned or intended

desired (de ZIRD) - wanted, or wished for strongly

desizing (de SI zing) - process that removes size, which is a stiffening material added to yarns during the weaving operation. This is done with a chemical bath.

determined (de TER mind) - found out exactly, or decided

direct printing (di REKT PRIN ting) - a way of putting designs on cloth, most often by using a roller

discharge printing (DIS charj PRIN ting) - the removal of dye from fabric in such a way that a pattern is formed. The area may be left white, or another color may be placed in the pattern area.

equipment (i KWIP ment) - tools or machines used to do a job

earlier (ER li er) - before now

fiber (FI ber) - a single tiny, threadlike part that makes up cotton and wool

fibers (FI berz) - the tiny threadlike parts of which cotton and wool are made

finishes (FIN ish ez) - things done to fabrics to give them special qualities needed for their end use

finishing (FIN ish ing) - things done to fabrics to give them special qualities needed for their end use

finishing treatments (FIN ish ing TRET ments) - things done to fabrics to give them special qualities needed for their end use

foam (fom) - a mass of tiny bubbles formed in water or other liquids

greige (gra) - unfinished fabrics just off the loom or knitting machine. This does not indicate color, for the fabric may be tan, gray, white, or already colored with dye.

intended (in TEN ded) - planned or meant

polished (POL isht) - smooth and glossy

preparation (prep u RA shun) - things or steps needed to get ready

pressure (PRESH er) - pushing against, or putting weight against something

process (PROS es) - a set series of things that lead to an expected result

protruding (pro TROO ding) - sticking out

purpose (PER pus) - the object, or the end for which a thing is made

removed (re MOOVD) - gotten rid of, or taken away

repel (re PEL) - drive back, or keep off

resist printing (re ZIST PRIN ting) - a way of putting a design on fabric. A chemical or wax coating is painted on the parts of the fabric that are not to be colored when the fabric is dyed.

resistant (re ZIS tant) - able to withstand the action or effect of something such as fire

routine (roo TEN) - a usual or regular way of doing things

mechanical (mu KAN i kul) - by machine

machines (mu SHENZ) - things made to do work

scoured (skourd) - cleaned of dirt or oil

shrink (shrink) - become smaller, especially when washed

singeing (SIN jing) - process that removes sticking out ends of fibers so that the fabric surface will be smooth. It is done with heated plates or open flames.

sliver (SLI ver) - a ropelike strand of fibers

solvent (SOL vent) - something, usually a liquid, that can dissolve other things

straighten (STRA ten) - pull and set so that the fabric will hang evenly

surface (SER fis) - the outside or top

techniques (tek NEKS) - special methods or ways of doing something

through (throo) - by means of

type (tip) - kind

unfinished fabrics (un FIN isht FAB riks) - fabrics that have been woven or knit, but that need one or more finishing treatments before they can be used

uniform (U ni form) - always the same and unchanging

usually (U zu ul le) - ordinarily, or most of the time

wrinkle (RING kul) - crease or fold

wrinkles (RING kulz) - creases or folds

B. Vocabulary exercise words (test words)

amount	intend	routine
application	polished	scour
bleach	pressure	shrink
construct	protrude	solvent
consumer	purpose	surface
create	repel	technique
determine	resistant	

True / False Questions
Module 5 - Fabric Finishing and Color Application

(The questions will be presented in a random order to the student)

True Statements:

1. Greige or gray goods are the fabrics just off the loom or knitting machine.
2. Finishing treatments for gray goods are determined by type of fabric and its purpose.
3. Chemical treatments are applied through water bath, foam application, or a solvent.
4. Routine finishes include singeing, desizing, bleaching or scouring, straightening, and wrinkle removal.
5. Chemicals can make fabric flame resistant, repel water or soil, be less likely to shrink or fade, and wrinkle less.
6. Piece dyeing is used for solid color fabrics.
7. Resist, discharge, or direct printing is used for printed designs.
8. Raised designs and polished surfaces are gotten by using heat and pressure.
9. Routine finishes are those usually given to all fabrics.

False Statements:

1. After the finishing treatments, the fabric is called gray goods.
2. Routine finishes include making the fabric softer, wrinkle less, flame resistant, repel water or soil, and less likely to shrink or fade.
3. Special finishes include singeing, wrinkle removal, straightening, desizing, and bleaching or scouring.
4. Mechanical finishes are applied with a water bath, foam application, or a solvent.
5. Piece dyeing is done by resist, discharge, or direct printing.
6. Heat and pressure are used to make a surface napped, such as the inside of a sweatshirt.

Fill-in-the-Blank Questions
Module 5 - Fabric Finishing and Color Application

1. Fabric just off the loom or knitting machine that has not been finished is called greige or gray goods.
2. Protruding ends of fibers are removed by singeing.
3. Chemicals applied earlier are removed by desizing.
4. A polished surface can be gotten through the use of heat and pressure.
5. Fabrics are made white by bleaching.
6. Fluffing, such as the inside of a sweatshirt, is done by napping with a wire brush.
7. Fabrics can be made to repel water through the application of chemicals.
8. The application of dye after the fabric has been constructed is piece dyeing.
9. One technique used to get a printed design is resist printing.
10. The amount of finishing is determined by the type of fabric and its intended purpose.

Section III

Evaluation Report a third party evaluation of the Workplace Literacy Systems Project (Grant #V198A1005) conducted by Literacy South.

Evaluation Report

National Demonstration Workplace Literacy Project Sara Lee Knit Products

Winston-Salem, NC

Andrew Pates
Hanna A. Fingeret

Literacy South
Durham, NC

October 1992

Contents

Introduction 4

1. The Project 5

2. Sara Lee Knit Products - The Company 11

3. Courses and Curricula 20

4. The Learners - Who They Are 25

5. Learner Expectations and Impact 34

6. Learning Outcomes 41

7. Findings and Recommendations 50

Appendices:

A: Methodology 60

B: CAI Course List 62

References

Acknowledgments

We should like to thank everyone at Sara Lee Knit Products who has made this work not just possible, but also enjoyable and interesting. In particular, we should like to mention the help and support we have had from Deborah Gaddy, Stan Ferguson, Jerri Cathey, Doris Kendrick and all the students and staff at SLED who have given their time and friendship. We also would like to thank Jaleh Estes for her tireless transcribing assistance.

Introduction

Despite the fact that the project being studied has now been in operation for over eighteen months, we are still defining the nature of the Sara Lee Educational Development Center (SLED). The formative element of the evaluation is definitional, exploring who is involved, how they are involved, how much they are involved and what they are doing. The nature of a new educational project is that we do not know what the learners will want, how they will behave, how they will use the facilities being created, or what the facilities will in practice be. In this particular situation, extra uncertainty is added by the continuing changes that have been taking place in Sara Lee Knit Products during the existence of SLED.

The study has therefore been concerned to identify what is happening, and also the perceptions and expectations of the different actors involved. In doing this, the study has identified questions which could usefully be investigated in the future.

Only limited summative questions can be realistically framed at this stage, and these hinge on the users of the facility. So, as well as identifying who is using SLED, we can also see how much they are using it and the extent to which they are completing their chosen courses of study. Whether they are achieving their identified goals, whether they are effecting substantial changes in their work, careers and lives, we cannot at this time tell. These are processes that unfold over time and this is only the beginning of the time scale involved.

The findings and recommendations in Chapter 7 therefore make proposals about the program but also suggest topics on which further evaluation should focus in the future.

Chapter 1

The Project

Background

The workplace literacy project at Sara Lee Knit Products (SLKP) in Winston-Salem, North Carolina, was set up as a business education partnership, funded by the US Department of Education, as a national demonstration project.

It was preceded by a collaboration between SLKP and Forsyth Technical Community College, supported by the North Carolina Department of Community Colleges, in 1990.

Project Goals

The goals of the project were:

- To increase the basic, job-related, and professional skills of adult workers at the Sara Lee Knit Products Company to meet the challenges of working in a world-class textile manufacturing firm; and

- To develop and package literacy system solutions - including interactive videodisc or compact disc, workplace literacy courseware modules - which can be effectively used throughout the textile and apparel industry. (1)

Intended Outcomes and Objectives

The specific outcomes of the project were to:

- enable workers to "enhance basic skills which improve their abilities to be cross-trained with other team members, to contribute to team and plant goals, and to become eligible for career advancement." (2)

- "develop and teach reading, composition, computation and problem-solving modules which center around issues such as world-wide competitiveness, quality control, employee development, and planning." (3)

These outcomes were to be achieved through the realization of seven objectives:

1. Assess skill requirements of job classes within the SLKP Stratford Road Plant.

2. Recruit participants and assess individual basic skills.

3. Develop a customized workplace literacy curriculum for the textile industry, built from a foundation of basic skills education.

4. Deliver workplace literacy program on site to the 600 employees at the SLKP Stratford Road Plant.

5. Convert the customized curriculum to interactive videodisc or compact disc courseware.

6. Evaluate the effectiveness of the Workplace Literacy System Project.

7. Determine the usefulness of and demand for the system developed through this project in other divisions of SLKP and other parts of the textile industry. (1)

This report fulfills objective 6 through a study that focuses on the ways objectives 1 to 5 have been approached in the first 18 months of the project. Objective 7 is about subsequent dissemination.

Proposed Program

The proposed program would:

- Provide SLKP workers who participate with sufficient basic education to enable them to benefit from job training and retraining programs, to perform their jobs more effectively, and to increase their eligibility for career advancement; and

- Provide a demonstration of a successful technology-based system of literacy instruction which can be replicated in other parts of the textile and apparel industry, and possibly other industries. (4)

Half of the employees at the SLKP Stratford Road plant would be expected to enroll in the program during its first 18 months.

Timescale

The Project started in March 1991, and at the time of writing (October 1992) is ongoing for a further twelve months. A GED course at SLKP, provided by Forsyth TCC, starting in November 1990, the Winter 1990/91 quarter, as part of the earlier collaborative arrangement, preceded the courses set up under this Project.

Organizations Involved

As a workplace education project, a number of organizations have been involved:

Sara Lee Knit Products is a division of the Sara Lee Corporation and employs around 600 people at its Stratford Road plant in Winston Salem. The workplace literacy project is housed here in the Sara Lee Educational Development center (SLED). The company supports the project in a number of ways, financial and institutional, which are described in Chapter 2. The employees of this plant, and of other Sara Lee plants in Winston Salem, are entitled to attend SLED to work on a variety of learning needs.

NCSU Literacy Systems Center at North Carolina State University is the lead organization in this project. The center was started in the Fall of 1989. It "provides consulting services involving information on instructional technology and courseware for adult literacy programs. The Center provides NC business and industry free service in support of the establishment of workplace literacy systems". (5) The Center "provides the overall planning and project management - utilizing the faculty resources of the NCSU College of Textiles and the College of Education and Psychology to provide the technical vocabulary and expertise for the curriculum-building effort related to basic job skills and integrated manufacturing technology specific to the textile and apparel industry." (6)

Interactive Knowledge Inc, a company in Charlotte NC, acted as a subcontractor to develop the multi-media interactive courseware for the project.

Forsyth Technical Community College (Forsyth TCC) in Winston Salem has provided instructional staff and an organizational framework for external validation procedures (in particular the GED test) and for standardized testing (using the CASAS skills assessment program).

As "partnership" was an important element of the Project, it could have been useful to review the working together of the different participants, their roles and relationships, and the elements of the partnership that were supportive or that provided obstacles. Partnerships in this sort of program are never unproblematic and are frequently extremely critical in the way the project works. However, this is not part of the evaluation brief and is not touched upon in the report as a topic in its own right; it would be well worth study in a future evaluation report.

SLED Staff

The project has been staffed by a Workplace Literacy Specialist (WLS) from Forsyth TCC (Deborah Gaddy) who has headed the Center and run the program for its entire duration. Additionally, there have been two part time instructors working in the center, employed by Forsyth TCC. During the first year, there was an additional part-time math instructor. In Summer 1992, the two instructors left to take other posts and were replaced by two new instructors.

The WLS is also supported by a part-time administrative assistant. During the first year, this role was fulfilled by one of the instructors. Since September 1992, an administrative assistant has been hired by SLKP.

Evaluation

Literacy South in Durham NC, was engaged to conduct a third party evaluation and develop this report. This work was conducted by Dr Hanna A. Fingeret, Literacy South's Executive Director; and by Andrew Pates, a freelance

consultant specializing in adult learning systems and a Literacy South Research Associate.

The major question to be addressed through the evaluation was:

> *What impact does participation in the program have on students' work, attitudes and literacy practices?*

Specifically, it was planned to examine:

Initial involvement

- How do participants explain their willingness to become involved in the program?

- How do participants see the relationship between their involvement in the program and their jobs?

- Do participants anticipate that participation will affect their relationships with each other and with their supervisors?

- How does the opportunity to participate in computer assisted instruction affect workers' decisions to become involved in the program? Does this factor change over time, as they begin to work with the computers?

Participation outcomes

- In what ways do the participants' developing literacy skills support enhanced job performance, including participation in literacy practices in new ways, changes in relationships with other workers and with supervisors, or changes in areas such as absenteeism?

- How have the workers' attitudes about their learning ability, about their jobs, about their future, and about the company changed?

- How have workers' attitudes and skills with computers changed over time?

- Does there appear to be a relationship between the curriculum used, the mode of instruction (computers, classes), and the impact of participation?(7)

Some modifications to the plan have been made as the work has progressed reflecting the development of SLED, the ways in which the curriculum has been implemented and the changes in the plant.

This report is made after 18 months of operation, and reports on the activity so far, identifies issues for the ongoing development of the Center, and suggests some questions that should be asked in the next year of the project.

Notes

(1) NC State University, Literacy Systems Center, "The Workplace Literacy System Project", Proposal to the US Department of Education, National Workplace Literacy Program, July 1990.

(2) ibid

(3) ibid

(4) ibid

(5) anon, "Adult Literacy in North Carolina and the Role of the North Carolina State University Literacy System Center". Raleigh: NCSU, January 1992.

(6) NC State University, Literacy Systems Center, "The Workplace Literacy System Project", Proposal to the US Department of Education, National Workplace Literacy Program, July 1990.

(7) Fingeret, Hanna, "Draft Evaluation Plan for Sara Lee Workplace Literacy System Project". Durham, NC: Literacy South, July, 1991.

Chapter 2

Sara Lee Knit Products - The Company

The Company

Sara Lee Corporation is the largest single employer in North Carolina. Sara Lee Knit Products (SLKP), headquartered in Winston Salem, NC, has over 22,000 employees in 59 manufacturing and distribution facilities in NC and four other southern states, as well as offshore. The Company acquired the Hanes company in 1979.

Sara Lee has been reorganizing its textile manufacturing plants to increase competitiveness. (1) This is a critical element in the story of the SLED Project as it has been operating against a background of continuous change.

The company has been active in workplace literacy education since 1989:

> "In 1989 the Sara Lee Corporation sought help from Forsyth TCC in working with literacy problems with its work force. The Stratford Road Knit Products Plant in Winston-Salem was chosen as its first plant to work in addressing these needs. The first phase of the program was designed to assist the Sara Lee Corporation in their efforts to improve the literacy skills of targeted employees, develop a process to customize workplace literacy curricula and share the process with other companies and community colleges. Forsyth TCC developed a grant proposal and submitted it in March 1990. Funding became effective July 1 1991. The program was funded through a grant from the NC Department of Community Colleges ($30,000) and Sara Lee ($25,000)." (2)

This plant was actively involved in this initiative from the start:

> "They picked a facility, well they didn't actually choose one, they asked different ones if they'd like to do it. We undertook it here and said yeah, we'll do it." [Manager, 9/24/91]

Changes, Changes

There have been changes of every sort at the plant over the last two years. A department has been moved out and another department has been moved in, so

that the actual work of the plant has partly changed. New plant machinery has been installed. There have been large job losses at the plant, followed by re-hirings. The staff changes have extended to management. Shift patterns have been reorganized.

> "I've been at Sara Lee going on 24 years this month and I've been in management since 1975. We've had some tremendous changes and, well from management to equipment and stuff, employees are working with just seeing, since well, since Sara Lee has taken over from Hanes, tremendous amount of growth in the company employment wise. And the employees themselves, the employees, I've seen well, a lot of changes in the employees and how the company has worked and how the company has benefitted the employees with better benefits and stuff of that nature." [Supervisor, 1/7/92]

The Company's Attitude to Worker Education

The Company has a supportive and positive attitude to its workers improving their education.

> "Through partnership in this project, the company has committed to launching its largest-ever attempt to upgrade the basic skills of its workforce." [Manager, 9/24/91]

This does not apply just to basic skills, though that is the focus of this Project.

> ".. as far as on the job training or seminars or things like that, ... it seems to be a priority with Sara Lee to give the opportunity to further supervisors, to go back and get seminars and courses. Very rarely have I been turned down if I want to go attend something or learn about something; it's never been for money reasons, it's always been for conflict in schedule." [Supervisor, 1/4/91]

The area of immediate concern is the upgrading of basic skills needed for the efficient operation of machinery, especially new equipment and for the more efficient performance of jobs by improving spelling, for example. There is also a more generalized concern to facilitate workers in their educational development for career enhancement and the improvement of their lives.

> "We've got new machines coming in, we've got machinery coming in that we're going to have to have someone - in order to operate it, in order to fill out reports, ... they're going to have to have some basic skills to go with it. And if they don't, they will not be able to perform

> that job. It's almost I guess a double-sided sword. The company won't have an advantage, and of course the employees won't have an advantage. I see it as a - it's a good program. It's going to serve something that we need from a company standpoint, that we're going to have better employees." [Manager, 9/24/91]

Sara Lee management seems willing to see people improve their education, even if it means people moving on and out of the company.

Support For the Project

They company supported the Project in a number of ways:

With Cash

They committed, for example, to a payment of $25,000 to Forsyth TCC (3) to help with the College's costs in the project.

With Time

The company allows workers attending the group sessions to attend half in company time.

Resource Input:

The company provided in-kind services such as printing and the use of equipment and furniture. This has involved the supply of at least twelve computers, and recently the provision of new furniture for the learning center. This year, the center has become a line item in the plant's budget and the company has paid for an administrative assistant to the Workplace Literacy Specialist.

> "I don't know the figure exactly, but there's been a lot of hours logged in here that the company's paid for. This in here wasn't cheap, this wasn't a gift, and we had to come up with money for that. And anything I've asked for so far has been 'Oh yeah, let's do it, that's not a problem, let's go ahead and get it.' Now, that wasn't the way it was at the start, when we first started out, it was tough." [Manager, 9/24/91]

> "I have much better facilities for this company than I do with the community college. For example, if I need to get materials run, we're talking about a time span wait to get materials run. You have to plan

way, way ahead if you want to have materials ready. Sometimes things come to mind that you'd like to have you know, pretty quick, within a day or so. Here we have access to a copier, all we have to do is go over and get the copies run off that we need. You don't have to worry about a problem with the time span between getting the materials. Here, students have accessibility to computers." [SLED staff member, 2/7/92]

Location

It has provided a learning environment which is free of noise and interruption, which is physically and acoustically isolated from production noise and high traffic.

Availability

The learning center is also open to families of workers, and several sons and spouses have made use of the opportunity.

Company Expectations

The Company clearly has expectations of SLED which go beyond the needs of individual workers. There is an expectation that the plant will be able to respond to specific needs as they arise, such as that expressed through the request to organize a metric math course. There is also a perception on the part of some management that people who have committed the energy to improving their skills will also have an outlook favorable to their work, such as that seen in the staffing of the new Printing Department.

The Metric Math Course

In the summer of 1992, the center was asked to provide a course in standard international measurements for all the staff of the Dyeing and Finishing Department. The staff were paid for the ten hours of the course, and they were also all expected to attend, including supervisors. The course was a response to the new machinery in the department and to the large amounts of waste being generated through inexact measurement.

It is a reasonable assumption that an in-house educational facility will be able to provide such training as needed and it is supportive to the center that it is able to meet such demands. It does, however, also pose issues about working

method; effecting learning with a large population, on demand, and in a constricted time frame, can not always be expected to lead to successful outcomes, and should not be expected to form the basis of overall educational provision. It is to the credit of the center staff that this course appears to have been successful. (There is more information about this course in Chapter 3).

The New Printing Department

In 1992, a new Printing Operations department was set up. The manager of the department, in thinking about staffing the department, asked for a list of graduates from the learning center and selected the staff from this list. The new Printing Operation appears to have started well. Interestingly, the manager of the department was newly appointed from out of state in May 1992. (4)

Productivity and Promotions

If the role of improved skills and education is to increase promotion prospects at the plant or within the company, then there is a tension at the plant. Traditionally, promotion has rested on seniority and there is a perception that race and gender also have both affected the likelihood of promotion to more senior management positions. African American and white supervisors disagreed, however, on the role of race in promotion decisions.

> "Hanna field note: He said that Sara Lee doesn't want to fire anybody because they invest a lot in training people for their jobs and so that they'll go to great lengths to keep people because of this big investment that they've made in preparing them to do their jobs."

The company has changed in many ways that affect management's stance on education for workers.

> "Our vice president, he's very much in favor of employee involvement. And I think that's good, because you're all here for the same reason. And that makes a big difference. This company is more so on a trend to that way. But you don't get there overnight, ... it takes some time. But we've got some plants that will have excellent programs going. This has been a tough nut to crack so to speak over the years, because of its history, for one thing. There's just a lot of history here, a lot of doing things one way. But a lot's changing. A lot of it [was because of who was in management positions]. And it's just well, we've never done it that way and we're not going to start now. And if you're going to survive,

you've got to change with the times, you've got to. You came here, you had a job for life. You've probably seen more turnover in the last year here than you have in the last 20 or 30." [Manager, 9/24/91]

Moreover, expectations may well be changing to relate to the changes in the plant itself. Changes imply threats to security and the need to look for marketability of one's skills; they also present opportunities:

> "You take somebody who's already a real good employee, just how much change is it possible to see in their productivity? So, given that, I guess I still come back to you know, what would be the outcomes of this program that would make Sara Lee feel this is a program we'd want to continue, you know, this is a program we'd want to spread to other plants, you know, this is a good thing. It could be something that says ... it has to do with people feeling like they're getting something, you're working for a company that you're feeling like you're getting something back, you're putting something in and yet they're going to take care of us. Thirty years ago, that may be the norm, the way it is now, people, when you go to work for a company, you don't know if you're going to be able to retire there, it's not that same security as it once was. So you've got to either, the company's given you a chance to improve your marketability as far as other jobs, and maybe they can find within that they can improve their employees from the standpoint of hey, we need to pick some supervisor trainees now, let's take a good look at who we've got. Hey, these people did really good on this, they've proved - let's give them a shot. Of course, the fallacy behind that is everybody thinks they can come in and take a course, and they're automatically going to get a promotion. And that is simply not the case. They've got to take it as a personal development." [Manager, 9/24/91]

In the end, SLED supports the company as well as individuals:

> "So, that's a prime example of that ... it is a goal of the company to get people to where they can run a machine, or to where they can do this high tech machinery we've got coming in. They can't read printout. That's the ultimate goal. If, on the road to that, these people get other opportunities, then fine, you don't want to keep somebody here that wants to go elsewhere. I mean, that wouldn't make sense. You want somebody that wants to be here cause they like it and they feel good about it. It meshes. There's no one way or the other." [Manager, 9/24/91]

Problems

There are some problems that impede the functioning of the Center. Some of these are structural, such as the shift schedule. Others are to do with attitude.

Shifts and Learning

Shifts affect learning in several ways: after a twelve hour shift, people may not feel like studying; when their shift changes, they may not be at the plant at the time of a class. During this period, shift patterns have changed, with resulting dislocation to the work plans prepared by the center.

> "The students I have only come in one day a week. It's because the way their shifts are set up. When they're off their shifts, they just come off of a shift and you're just not going to get people unless they're totally dedicated to it to get up at 5:00 in the morning, to drive from 25, 30, 10, 5, you know, whatever the miles may be, to come in for 3 hours, and go back home and go to bed. It takes a lot of dedication for that. And for that reason, it's made it very difficult on the attendance part. So, for only that period of time and missing that much, it's very hard to really determine how much progress they have made. And probably - there is some progress, sure, everybody's learning, but how much it shows up is really very difficult to interpret at this time.
>
> I had many questions in my mind about a 5:30 to 8:30 program. I didn't judge it one way or the other, although I did have some questions when I came into it. 5:30 to 8:30 in the morning is a very difficult time for ones' mind to be focused in on you know, learning and education. It's a very difficult time because most people are just not programmed at being fresh and wide awake at that time of the day. And the majority of the group are coming off at the end of a 12 hour shift, so they're tired and they're weary. I mean it doesn't matter what kind of a program you set yourself on, very few individuals are really wide awake and alert at that time of the day, or coming off of a 12 hour shift. The best way I can see to make the program be most effective is to open things as much as possible throughout the day, to try to set up certain segment times within that period to offer it available for a person to come in. That's where a computer may be beneficial for this type of a program, because a computer is always sitting there waiting for somebody to sit down to use it." [SLED staff member, 2/7/92]
>
> "When we changed quarters and they changed work schedules here, that was a crisis time. We were looking at possibly losing all of our former students, maybe even losing a program so to speak. We had no idea of how we were going to work through that. I was literally spending my entire days and nights out here and my days started at 4:00 a.m and ended at 9:00 at night. I did that for two weeks and just about burned out. Because, somebody had to be here all the time in order to make that work." [SLED staff member, 1/7/92]

Attitudes

There is however a variability in the attitudes of the people needed to make the project work. For example, it is necessary for supervisors to be willing to let people have time off to attend the learning center; from the information we have on dropout (see Chapter 6), this is clearly not always the case.

Summary

The company has supported and encouraged the development of the Educational Development Center from early on. The support has grown as the facility has moved from a plan to actual provision. The company has mixed expectatiqns of the educational program, ranging from direct outcomes such as improved measurement and writing skills that will improve productivity to a more generalized concern with staff welfare. This has taken place against a background of continuous changes some of which has caused problems for SLED and for learners, especially the shift patterns. However, the changing environment is also an important reason for the support the facility gets from management and workers.

> "In my situation where I've got three girls covering. They're basically trained and cross trained so that they can cover each others jobs and if one of them has left to go to this class, the other two are more than happy to fill in, take up her slack, because they know in the end not only is that person going to benefit but everybody will benefit because there's a lot of paperwork in my area, and the people who have deficits in learning may actually hamper situations and after they're through with this, then it could make everybody's job a whole lot easier because the paperwork will be filled out more completely, legibly, make more sense, cause I have some folks that have poor English, poor spelling, and it becomes difficult because there is a lot of written communication and the folks here are great about just filling in. You know, there's no 'that's not my job', 'I'm not going to do it', you know, 'she's gone off running' around going' to school', but we haven't heard it." [Supervisor, 1/4/91]

Notes

(1) Therrien, Lois, "This Marketing Effort Has L'Eggs", *Business Week*, December 23, 1991.

(2) Gaddy, Deborah, "Sara Lee Educational Development 1990-91". Winston Salem, NC: Forsyth TCC and Sara Lee Knit Products, 1991.

(3) Volz, Doug, Vice President Human Resources, letter to Bruce Poulton, June 28, 1990.

(4) *The Stratford Insight*, Vol 1, No 3, August 1992.

Chapter 3

Courses and Curricula

Organization

The courses offered in the Sara Lee Education Development center (SLED) are organized in quarters, to match those of Forsyth TCC, and this is used as a convenient format in which to describe the working of the center, the courses offered and the cohorts of learners entering SLED. At the time of writing, we are in the seventh quarter of the project (Fall 1992), the project having formally started with the Spring quarter of 1991. (The teaching program and GED courses started in November 1990.)

The courses offered during this time were of two distinct types:

- those based on group enrollment and involving a mix of group and individual instruction;

- those based on individual study, using computer aided instruction (CAI).

This is not in fact a rigid differentiation since the people enrolled in the group based learning also pursued individual CAI study programs as part of their classroom sessions.

These course offerings may also be characterized by their curriculum, the learners enrolled, the possible outcomes and by the learning materials involved.

There were five distinct course offerings during the period:

1. A GED class which began in the Spring quarter of 1991, and which has repeated each quarter since then.

2. A "Job Enhancement Skills" (JES) class which began in the Fall quarter of 1991 and has repeated each quarter since.

3. A facility for individual study using computer aided instruction. (CAI). This also started in the Spring quarter of 1991 and continues.

4. A metric math course held in July and August 1992, for four groups of learners, each of which attended for two sessions. This combined group instruction and individualized computer assisted instruction.

5. A group also field tested a computer package in February 1992 (called here the Interactive Knowledge Field Test - IKFT). The learners who followed this short course were already enrolled in other courses.

The GED Course

The GED course is one of two supported by Forsyth TC College. This is open to anyone who does not have a high school diploma and who works for Sara Lee or has a family member who works for Sara Lee. All the students joining the class are tested when joining the class using CASAS "Employability Competency System". They are also tested using the TABE standardized test (language arts and spelling modules which are not in CASAS), and BASE (the "Basic Academic Skills for Employment") which is a competency based on computer diagnostic system.

Learners follow the BASE computer-based course and the GED units of the Computer Curriculum Corporation (CCC) CAI package. The BASE and CAI units employ their own progress testing within the units but learners are not formally retested during their time in the center. Since they are working for the GED, an external national test, they complete the practice GED test and the test itself.

The course runs Tuesday and Thursday from 5:30 - 8:30 pm. It is supported by the company in that half of the course is in company time, and half in the learners' time, the course being timed to straddle the shift change. The instructors are paid by Forsyth TCC and a minimum enrollment of ten is required for the course to be maintained.

In the first three quarters it was held from 2:00 to 4:00 pm but this changed with the change in shift patterns. In the Spring quarter of 1991, there was also an early morning class from 6:00 to 8:00 am but this was not continued in subsequent quarters as half the class graduated and the remaining number of learners was insufficient to meet the number requirements.

The JES Course

The JES course, the second supported by Forsyth TCC, is classified by the College as an Adult Basic Skills (ABS) class. People testing at above the 8.9 grade level are not entitled to enroll on this course. The learners entering the course also are tested using CASAS and BASE, and they may use the TABE test if they are pursuing academic goals.

The curriculum is intended to be work-based and to develop the participants' work skills. The core curriculum for this group is the BASE computer-based course and the learners also follow the "Pre-Employment and Work Maturity" and some other units of the CAI courses (courses from the Computer Curriculum Corporation "CAI Learning Center").

Attempts are made to retest learners at the end of their second quarter using the CASAS workplace assessment, otherwise progress is measured by completion of particular course units.

The course runs from 11:30 to 2:30 on Tuesday and Thursday, with 90 minutes of time being paid by the company, 90 minutes given by the learner. The instructors are paid by Forsyth TCC and a minimum enrollment of ten is required for the course to be maintained.

CAI Learning

The CAI facility has been available since the Spring quarter of 1991. The learners entering this program are tested using the CASAS appraisal for job-related literacy competencies and the TABE for those with academic goals (i.e. starting coursework at FTCC in curriculum programs).

The CAI units available for study are grouped into five categories:

- Mathematics and Science
- Reading
- Language Skills
- Basic Skills Competency

• Computer education.

A full list of the courses available, and the time needed for each, is included in Appendix 1. These courses include their own progress testing. Students are assumed to have passed the course if they achieve a score of 80% or more.

Four terminals are available for learners to work on these units and they may attend at any time the Center is open. They study on their own time. An instructor is also available when the Center is open - Monday to Friday, 8:00 am until 8:00 pm, and by special appointment at other times.

Learners are allowed to enroll for up to five course units at a time.

Metric Math

The metric math course was different from all the others just described in that it was requested by the company, and the workers who attended were all instructed to do so; with all the other courses, attendance was voluntary. The learners were all from one department(the Dyeing and Finishing Department) and all the staff were required to attend, including supervisors. The machinery being introduced in this department necessitated metric measurement and the workers needed both familiarity with metric measurement and the facility to translate between metric and American measures.

The course was taught in two sessions, each of five hours, repeated four times to cover all the staff of the department.

The group was pretested using the CASAS appraisal and TABE before the classes started. The course covered:

i) addition, subtraction, multiplication and division of fractions and decimals;

ii) introduction to metrics;

iii) hands on measuring (meters, centimeters, millimeters);

iv) introduction to computers using BASE.

IKFT

One of the aims of this project was the development of interactive computer software which would be based on material relevant to the particular plant in which the learners worked. However, only a sample module was ready during this project, and this was tested in February 1992 with 13 volunteers, mainly from the JES course. These were compensated for up to five hours of work on the course, and they had to do the work on their own time.

Ten units of the course, five dealing with language skills and five with mathematical skills, were delivered to the Center in October 1992.

Summary

Five courses were offered during the first seven quarters of the project. All were voluntary except for a short metric math course that was run for all the staff of one department. Three were group taught courses (the GED, JES and metric math courses) and two were computer based (the CAI course and the field test of the Interactive Knowledge module), though the GED and JES courses included computer modules.

Chapter 4

The Learners - Who They Are

A few learners started work at SLED before the formal start of the project. The core enrollments were with the GED and JES classes and with the Computer Aided Instruction. The Metric Math and the Interactive Knowledge Field Test are also documented since they provide some interesting insights into the work of the Center.

The GED Class

Some learners started in the Winter of 1990 with institutional support from Forsyth TCC, but the first formal groups in the project started in Spring 1991. At that time, there were two groups, an early morning group and an afternoon group. The morning group stopped in summer 1991 and there was subsequently only one group. The numbers of enrollments are as follows:

Table 4.1 GED Enrollments by Quarter

1991				1992			
1st	2nd	3rd	4th	1st	2nd	3rd	Total
16	8	11	11	9	18	8(*)	81

(*) The Fall 1992 quarter is still enrolling learners at the time of writing.

It should be noted that these are enrollments, not people, since many people continue attending a course over several quarters. The numbers of individuals involved are shown below:

Table 4.2 GED Learners by Quarter

1991							1992						
1st	2nd		3rd		4th		1st	2nd		3rd			total
Total	cont	new	cont	new	cont	new	cont	new	cont	new	cont	new	
16	8	0	8	3	8	3	5	4	6	12	3	5 *	45

(*) The Fall 1992 quarter is still enrolling learners at the time of writing.

These figures are compiled from the course registers kept for Forsyth TCC.

It should be noted that some learners appear from the course registers to have had a break of several quarters and then to have re-enrolled, in which case they will be recorded here as new enrollments. Some appear to have enrolled as CAI students first, then to have joined the GED group; some have done the reverse. This is partly a reflection of the fact that some learners are not able to join a group course because of their work pattern, and therefore start with CAI and move on later to a group course. Others start with a GED class and subsequently continue with individual CAI programs. On the records of CAI learners (see below) some of these same learners appear to have been continuing CAI/GED learners during the break between quarters. There is insufficient information to document all such learner movements and it is not possible to track each learner exactly without interviewing them all. The information reported here therefore gives the minimum level of activity, with a high probability that the actual level is somewhat higher.

The Job Enhancement Skills Class

The first JES group started in Fall 1991. The numbers of enrollments are as follows:

Table 4.3 JES Enrollments by Quarter

1991		1992			
3rd	4th	1st	2nd	3rd	Total
8	28	14	14	14	78

The numbers of individuals involved are shown below:

Table 4.4 JES Learners by Quarter

1991			1992						
3rd	4th		1st		2nd		3rd		total
total	cont	new	cont	new	cont	new	cont	new	
8	5	23	12	2	14	0	3	11	44

These figures are compiled from the course registers kept for Forsyth TCC.

Computer Aided Instruction

The first CAI learners started in Spring 1991, though a few people had been working individually before that date.

The figures for CAI enrollments are more complex than those for the group courses. A regular attendance register is not kept, as is the case for courses sponsored by Forsyth TCC, the same information being gathered instead on weekly sign-in sheets. To obtain more accurate user figures, it would have been necessary to analyze the weekly sign-in sheets which would have taken too long. A search of the record automatically kept on the computer for each user, would only show the last time they signed on and their total time working on each course. With 144 separate CAI users engaged in 495 separate courses, the amount of work necessary to search the computer records manually would not be justified for the amount of information it would generate, and there is no facility to generate this information electronically. This information has therefore been compiled from the quarterly registration sheets that are kept and which include all CAI users including GED and JES students who are using CAI as part of their course; these were then deducted from the total CAI registrations. The estimated numbers of registrations are as follows:

Table 4.5 CAI Enrollments by Quarter

	1991				1992			
	1st	2nd	3rd	4th	1st	2nd	3rd	Total
GED:	11	0	0	2	19	4	2	38
JES:	1	0	0	3	8	6	7	25
Ind:	46	19	0	7	82	31	5	190
Total:	58	19	0	12	109	41	14	253

These figures clearly do not give a complete picture as they contain some dramatic gaps, and must again be treated only as minima. They do not reveal the fact that some CAI learners do not enrol every quarter, but have gaps between the quarters in which they are registered.

A different perspective can be gathered on the CAI learners by looking at the different courses selected for study.

Table 4.6 Learner Enrollment in CCC Course Units

	CAI	GED	JES	Total
Mathematics and Science				
MCS: Math concepts and skills:	34	6	5	45
PS: Problem solving:	4	0	0	4
EM: Math enrichment modules:	3	2	0	5
LOG: Introduction to logic:	17	0	1	18
AT: Algebra topics:	58	6	3	67
SD: Science discovery:	4	1	0	5
Reading				
IR: Initial reading:	1	0	0	1
CRS: Critical reading skills:	5	0	0	5
TRN: The reading network:	19	2	3	24
Language Skills				
WPS: Writing process and skills:	10	2	2	14
ESL: English - second language:	1	1	0	2
FUN: Fundamentals of English:	14	3	3	20
ALS: Adult language skills:	1	0		1
Basic Competency				
KS: Keyboard skills:	85	16	8	109
PRS: Practical reading skills:	8	0	2	10
SS: Survival skills:	3	0	0	3
GEDP: GED preparation:	7	22	0	29
ELW: Essentials for living and working:	7	1	10	18
Computer Education				
CLE: Computer literacy (begin):	51	7	9	67
CLS: Computer literacy:	30	3	0	33
BP: Programming with BASIC:	11	0	1	12
PAS: Computer science with PASCAL:	2	0	0	2
Total	376	72	47	495

Notes:

1. Each unit has only been counted once for each learner, even when they have reenrolled after a break, it being assumed that they have just picked up where they left off.
2. However, if a GED or JES student has started a unit while in GED/JES and then continued the unit later as a CAI student, or has enrolled in units as a CAI student and then continued them as part of a GED/JES course, they have been counted twice.

It is notable that there is a strong dominance in enrollments for math and computer courses.

Metric Math Course

Forty seven people were enrolled in the Metric Math course in July/August 1992. They were the total staff of the Dyeing and Finishing Department and they attended the two-session course at the company's request. This group offers a useful basis of comparison with the learners enrolled on the three previous courses when we come to look at the demographic features of the learners in the Center (see below).

The Interactive Knowledge Field Test

Fifteen people took part in the Interactive Knowledge Field Test. They were all members of other courses and cannot be counted as separate learners. Of these, ten were JES students, two were GED students, two were CAI students. In addition, one supervisor who was not enrolled in a program participated.

Summary: Total Numbers of Learners

Over the seven quarters of the program, over two hundred learners have attended the Center. Table 4.7 provides a summary of the enrollments in different courses:

Table 4.7 Total Enrollments by Quarter

	1991				1992			
	1st	2nd	3rd	4th	1st	2nd	3rd	Total
GED:	16	8	11	11	9	18	8	81
JES:	-	-	8	28	14	14	14	78
CAI	58	19	0	12	109	41	14	253
MM:	-	-	-	-	-	50	-	50
Total:	74	27	19	51	132	123	36	462

As explained earlier, the enrollments are more than the total number of people involved. The total number involved in each program is, in summary:

Table 4.8 Total Learners by Program

GED:	47
JES:	42
CAI:	107*
MM:	47
Total:	243

* not including people who were using CAI as part of their GED or JES course.

Demographic Characteristics of the Learners

Some demographic data is available for the learners in the different programs. The characteristics collected cover age, race, gender, previous level of education, length of time with the company, where they work (i.e. which site, and whether employed by the company or a relative of an employee), and job. The data are all collected at the point of entry to the program.

As mentioned above, the Metric Math group represents a different type of group than the others. The GED, JES and CAI groups all enrolled at the Center on a voluntary basis; they come from a range of sites and jobs. No comparison of these groups with the total company employees is possible without information about all the company employees, which is not available. The Metric Math group however does provide a useful group for comparison, being made up of the total staff of a department, including supervisors. It is therefore included here. The learner's jobs are not reported here as there is considerable inconsistency in the terms they use to describe their job on the Participant Pre-Training Survey, and further work needs to be done to clarify many of the records before this information can be analyzed.

Table 4.9 Age of SLED Learners

Age Group

	19-25	26-35	36-50	51-65	Unknown	Total
GED:	11	17	13	2	2	45
JES:	2	11	16	4	9	42
CAI:	5	36	24	6	34	105
MM:	6	15	12	14	-	47
Total:	24	79	65	26	45	239

It is noticeable that there is a concentration in the 26 - 50 age groups, with low figures in the 50+ age groups, suggesting that interest in education might be greater amongst workers thinking of job mobility, rather than retirement.

Table 4.10 Gender of SLED Learners

	Female	Male	Unknown	Total
GED	29	16	-	45
JES	19	15	8	42
CAI	36	43	26	105
MM	14	33	-	47
Total	98	107	34	239

No dominant trend is noticeable here except for the dominance of women in the GED classes. If the figures for metric math reflected the proportion of women to men in the plant, the figures would the suggest that women were more heavily represented in the SLED programs than men; we cannot make this deduction but it is a possibility that would match our knowledge of enrollment in such adult learning programs and would have implications of future recruitment and it is an issue worth investigating further.

Table 4.11 Race of SLED Learners

	Wh	Bl	Ind	Hisp	Asian	Un-known	Total
GED	31	10	0	2	0	2	45
JES	13	18	1	0	0	10	42
CAI	41	28	0	1	1	34	105
MM	23	24	0	0	0	0	47
Total	108	80	1	3	1	46	239

Again, no clear trend can be seen here except for a slight dominance of white workers in the GED and CAI classes and of black workers in the JES class, but we have insufficient information about the racial make-up of the plant workforce to interpret this data.

Table 4.12 Previous Education of SLED Learners

	-G8	G8-11	G12	G12+	Deg	?	Total
GED	1	32	4	0	0	8	45
JES	1	2	19	4	0	16	42
CAI	1	3	38	24	3	36	105
MM	0	7	16	9	3	12	47
Total	3	44	77	37	6	72	239

The noticeable fact about this data is that the great majority of users of SLED are high school graduates or above, except, by definition, for those in the GED classes. This suggests either that there are few workers at the plant with an education below grade 8, or that they are not becoming involved in SLED . We do not have any statistical data information on this issue.

Table 4.13 Length of Employment at SLKP of SLED Learners [years]

	-1	1-2	3-5	6-10	10+	n/a	?	Total
GED	6	2	13	1	13	3	7	45
JES	2	1	4	3	18	0	14	42
CAI	8	1	28	12	19	0	37	105
MM	3	0	7	8	18	0	11	47
Total	19	4	52	24	68	3	69	239

The noticeable trend here is the high number of SLED users who are long time employees at the plant. There is another possible trend also in that there might be a high interest in educational opportunities for new employees at the plant.

Non-Starters

In addition to the dropouts in the different courses described above, there is another group that would be worth study. There seems to be a large number of people who have come to the Center for an initial interview and assessment, but who have not subsequently proceeded with courses. We have no data at all about these people. However, the initial contact with a learning organization is an important element in an adult's learning career. This experience, and the reasons for not subsequently pursuing learning, would be well worth investigation.

Summary

Approximately half the staff of the plant joined some learning activity at SLED and engaged in nearly 500 units of computerized learning. There was a strong pattern of activity and inactivity punctuated by breaks. We cannot say a lot about the demographic make up of the learners except to say that there was a tendency for people to be aged in their middle years; a slight dominance of women over men; a clear preponderance of people who had completed their education at a level of Grade 12 or higher; and that there were more people who had been working at the plant for a longer period.

Chapter 5

Learner Expectations and Impact

Learners attend SLED voluntarily and it is notable that in the short period of its life, approximately half (1) the staff of the plant have attended one or more courses. While a variety of notions exists of the intended outcomes of a workplace learning facility such as SLED, there is clearly not one short-term set of outcomes that can be directly attributed to particular pieces of learning. The account of company expectations in Chapter 2 indicates that SLKP expects a variety of outcomes to be likely and if we now turn to the learners' accounts of their experience, we find a very similar view.

This Chapter is based on the data collected in interviews with learners in particular from the GED and JES groups.

Reasons For Attending SLED

The reasons given by a group of JES students in September 1991 were both personal and work related.

> "I've been with the course for quite a while. And the reason I want to come is to better myself like the others in here, you know, get a better job, move up, and better myself, learn more about the computer work, learn how to read more, learn how to spell. That's basically about it."

> "The reason why I'm here is because I've been out of school for about 12 years and I lost a little bit of that touch I used to have. So some of the words when I'm reading, I don't know it, and I can read around it, but I still don't know that word and what it means. And I'm not good on spelling, so I really want to come back and spell some of words I don't know, and that's basically why I'm back here."

> "It's going to be able to help us, on the job and later on, maybe off the job. You stand a better chance of making it with it than without it. Because like working on the die line, you've got to know all that stuff, especially reading, like 'caustic', and all this stuff they'd be putting in there. See, if we don't know what it mean or what it say, how can you put it in there? You get tired of saying, 'well, is this the right thing', you know? Eventually you can see it and get used to it, but it changes up on you"

It was also about managing change in their working lives.

"The reason I wanted to take the class was because the job that I do out there is physically tiresome and with taking thyroid medication, I really don't need to continue working that physically hard because he says I shouldn't do that, but I need a job, so I do it. But I also, I'm not sure that I want to stay here past 55 which I will be next year. And I don't mind staying here if I can move to another job, and that's why I became interested in this course. If they could train me in something Sara Lee has that I could move to, then I would be glad to stay here. But if not, then I would rather retire and maybe take these skills."

"I'm a knitter. The first time I signed up for the course, well I didn't come because a lot of people told me it was just if you wanted your GED, which I already had a high school diploma. I talked to one of them, and some of the other girls in the plant, and they told me that you know, there was several different things that you could take up. When I did finish high school I went to business school for about eight months, I took up data processing. And the computers, working on the computers, it's helping me a little bit. Really, it's nothing that refers with my job because I run a machine, but I really want to better myself, and I want to get a better job. And I know in order to get a better job, inside Sara Lee, I would have to have some skills. And so that's really the main reason why you know I'm here. I plan to further it by taking up some extra courses at Forsyth Tech. By me being out of high school so long, some of this you know, it will refresh me like in the math department."

"I've been doing - ever since I've been here, it'll be 20 years next month, it's physical. I'm ready to use my brain instead of my body so much."

They had a realistic view of the changes happening in the work environment.

"The way I see it is it's going to take a more educated workforce in the future, because everything's getting so technical. Computers, are everything, and they're just going to need them. The days of dropouts getting a job at 16 is practically over. They are using computers on some machines and all throughout the plant, they're keeping up with inventory and everything's done with computers." [GED graduate, 9/23/91]

They did not necessarily expect immediate job change as a result of learning and took responsibility for their own subsequent work and career development.

"I wouldn't mind doing another job at Hanes. They changed so much out here over the last past 13 years. I've seen them do away with a lot of things, I've seen them do away with a lot of people. And you know, to me, there's no job that's guaranteed. I know that if I go and get diesel mechanics, it's not a guaranteed thing you can find a job out there in diesel mechanics. But I wouldn't quit from here until I had another job.

> And Hanes, as far as being a fixer, it's the only way you're going to make any money in here. And you know, there's certain things about Hanes, on certain jobs, they have their picks they want.on this job and who they don't want on this job. So, you know, it's no guarantee that you can come up any further than what you is now." [GED student, 9/25/91]

Many had hopes or plans for continuing with other learning.

> "That's the main objective for coming back to school, really, because I like auto mechanics, I like doing it on the side when I ain't here. I work on cars a lot, trucks. I wants to go on to Forsyth Tech and take up diesel mechanics. And in order for me to do that, I have to get this first." [GED student 9/25/91]

The Experience of Being a Learner

Learners were comfortable with the facility.

> "I like the instructors, real friendly, they made you feel right at home. You made a mistake, it wasn't a thing of tearing your head off, they work with you to try and get it right. You can see a lot of people in the class, you could tell it was real interesting. One particular individual we had in there, she couldn't read, but it made me feel good to see her trying, you know what I'm saying, sitting there watching her try. And the people that were in the class with us, I think it kind of made them feel good too. Because I can look around and there wasn't nobody really - you know like making fun of her. And I think she's gotten better. The last time I talked to her, she talks real good." [GED student 9/25/91]

They also liked using computers to learn.

> "It really helps. Because you know, when you just listen to [teacher] there, and certain words that you don't understand, on the computer you have more time to sit back and look through the dictionary and find the word, look and see what it means." [GED student 9/25/91]

They did however, also appreciate and value the support and interaction they got from working with a teacher as well as a computer.

> "I feel like to me, a prayer of mine has really been answered because when I was coming over here, working on the computers, it was fine, but I guess, like so many of the others, I'd been out of school for so long, and I wanted a teacher. You know, the computer is fine, but in the math, that's what I wanted to go back to, because really, I forgot more than I ever learned ... I tried some math on the computer the first time, and I don't think I did try it but once, because you know, the basics was fine, I pretty well mastered that. But, when it came down to like fractions, it's like I forgot all of that, it's like I never had it. And that really became kind of complicated, I really started getting discouraged. And so even

though since I've been coming over here on the computers, I just left the math alone, just left it alone. So when I heard about this class, to me that was like a prayer that was really answered, because I've always wanted a teacher." [JES student, 9/23/91]

Supervisor Attitudes

Supervisors were reported as being supportive.

> "He encouraged us, and a lot of us that were taking it, he says go for it." [GED graduate, 9/23/91]

We don't know of course whether some people didn't use SLED because of lack of supervisor support and any such experiences would be difficult to catch interviewing SLED users.

The Shifts Problem

The problem of attending classes and working long shifts has already been mentioned, and features too in the concerns of learners.

> "It all depends if we go back on 12 hours or not. If we go back on 12 hours, at Forsyth Tech, certain classes is only Wednesdays and Thursdays, Wednesdays and Fridays, something like that. And if I can get that, I won't have too much of a problem. And then again, Hanes usually, if I can get somebody to switch with me every now and again, I can do it I'll work one day for him and on a certain day he'll work for me, the day I go to class. As long as you have somebody to take your place." [GED student 9/25/91]

Why Some Don't Use SLED

Some people don't come in to the program because they can't afford to leave the job, because of the impact on their wages.

> "When you're on a production job, ... we're talking about just coming from two to three starting next week. Because when you're on a production job, all they pay you is straight pay, they don't pay your production and see, that hurt. Because I was missing about $11 for one day." [GED student, 8/1/91]

Some are thought not to attend because of embarrassment, not wanting people to know that they didn't complete school.

> "I think everyone that needs to should get into this program. There's quite a few people here that they don't have no high school education and I think they should get enrolled. I don't know if they might be scared to step forward, I don't know whether it's they're ashamed that they don't or I guess maybe a little frightened, just of what people would think, 'hey, she don't have a high school education'. But I'm not sure why they don't get involved. They should, because it's really a good thing." [GED student 9/24/91]

Some also thought that the offerings of the Center didn't match their particular needs.

> "I think that if it was related to the equipment that I'm working on, if there was a schooling program related to that, I'd love to have it." [non participant 9/24/91]

Outcomes

One of the intended outcomes of the Project was to:

> "enable workers to "enhance basic skills which improve their abilities to be cross-trained with other team members, to contribute to team and plant goals, and to become eligible for career advancement." (2)

The students were realistic about the possible outcomes that they could expect and took responsibility for them.

> "It's not my job, I want to do something else, if I can you know, better myself,inside Sara Lee, fine, if not, outside of Sara Lee. Because I don't plan, I did this for 20 years and once I better myself, one way or the other, I'm out of it." [JES student, 9/23/91]

The learners have a realistic view of the changes happening in the world of work and the importance of learning for their future employment.

> "My father works for Sara Lee. My mother had worked for Sara Lee, my mother became a housewife after she left Sara Lee. Well more or less she worked in the same atmosphere I did, working production. And my father is skilled in the production. He was the machine in front of me, my machine fed his machines. So see now in the position I'm in now, he

says 'you're spoiled rotten now', and I said 'you're dang right I am'.[I left school in the 8th grade] then came here. Now see that's the penny drop right there. Because see I left school to come to work. And back in '78 it was not the mind that controlled your advantages into other places on higher ground, it was your backbone and your hands and your capabilities of pushing. But as time went on, what 10 years, 15 years down the road, ahuh, it's a backlash now. You pick up a paper, you'd better have a GED, degree or something, or you don't have a job. So, I'm in the same place where I had started at, but I have pursued a lot better ground, at least a step higher than what I was." [GED student 9/25/91]

The Impact on Self-Confidence

Above all, participating in SLED had an effect on learner's self-esteem, confidence and behavior.

"But this is helping our self-esteem and it's making me think. I was afraid to even mess with the computer. So, by getting this, if I have to go somewhere else, you know, Forsyth Tech, then I won't be so afraid. Because my children - I've got daughters - they say, 'Mommy, you're always scared to do this, scared to do that, mommy you can do it.' So now I feel like telling them 'hey, I can do it, I don't mind trying that', so that's the way I feel about it. The course has helped me, and (the instructors) have been really good. They're real patient and they's helpful." [JES student, 9/23/91]

"I really enjoyed it. And I feel real proud of myself now, finding out that I'm not as dumb as I thought I was. Just being in classes was enjoyable, the classroom lessons and finding out I could do things that I really, you know, wasn't sure about, in the math, some algebra and stuff like that that I had no idea that I knew anything about. It's given me enough confidence in myself to apply for more jobs here at the plant, things that I would have never thought, you know, try them because I just didn't have the confidence. I'm a knitter. I've applied for a job in quality control, there's a lab technician job, that's the one I'm waiting to hear on. I applied for a job in industrial engineering, it's really a complicated job, but it's something I never thought would be available to me." [GED graduate, 9/23/91]

"For me, it's probably the most important, it's how it makes you feel. I'm 52. I dropped out when I was 17 - 16 so it's been a long time, I've been out of school a long time. At first it was real hard for me to try to get back into it, I had been out so long. Now it's just, I look forward to attending my classes. I still haven't got my GED, but I'm still working on it." [GED student 9/24/91]

"I sit down now, I read a book, from cover to cover. Because of that I can really get into it now. Because if I read a book over 15 minutes, I get bored, I figure you know, 15 minutes into a book ain't going to get you to

the good parts anyway. So you know, I start reading a book and I keep going, keep going, and going. I hit a part that sounds kind of interesting. Let me go on a little further. And the next thing I know I'm at the end of the book. I like mysteries, novels, and comedy. The only time I pick an automotive book is when I work on one. And I look at the book find out where I need to look, what kind of problems it could be having, and I go from there. I understand things more, and I have more patience now. At first I had a real quick temper. And you know, I got frustrated real quick, and I just wouldn't go back. But now you know, just sitting down talking to (the instructors) I have a lot more patience, with life in general. I can relate to people more now than I could then. Like, say, if somebody came up to ask me something about something they heard on the news, you know, I wouldn't even look at the news. But now you know, that's part of my every day thing now. I go in there and look at the news, I read the newspaper, I find out something's going on. At first you know, well if I hear about it I hear about it, if I don't, I don't." [GED student 9/25/91]

Summary

Learners use SLED for a variety of reasons; they want to keep their job, to perform better in their job, to get a better job, if necessary, to move on to another job. They are profoundly work focussed and they recognize the importance of education for workers today. They are realistic about the lack of long term job security but positive about their ability to deal with it by improving themselves.

They like the experience of using SLED and appreciated the different learning they obtained from both working with computers and working with teachers. They value education and feel that this is making up for something that they have had lacking. Above all else, the experience of learning at SLED has developed their self-confidence as learners and as people.

Notes

(1) It is not possible to say exactly what proportion of the workforce has used SLED as the staff levels have changed frequently during the past two years, ranging from about 400 to about 600.

(2) NC State University, Literacy Systems Center, "The Workplace Literacy System Project", Proposal to the US Department of Education, National Workplace Literacy Program, July 1990.

Chapter 6

Learning Outcomes

Possible Outcomes

There are a wide range of possible outcomes from any learning program. In this case, we can identify:

i) Progress made by learners in their individual learning programs.

ii) Personal and career development achieved by learners, as a consequence of their learning activities.

iii) Outcomes for the company.

The first of these is in some ways the more limited set of outcomes which are also potentially easier to enumerate. The measures available for such enumeration are however, limited and are discussed below.

The personal outcomes for learners have been touched on in the previous Chapter. Without more extensive interviewing, and preferably tracking of subsequent careers of some learners who have completed work at SLED, it is not possible to say that there is a clear trend in the subsequent career of learners, only that some beneficial outcomes are suggested.

The outcomes for the company have not been systematically investigated. Some hints are available and are mentioned in Chapter 2, such as the staffing of the new Printing Department with SLED graduates, and the successful completion of the metric math course mentioned later in this Chapter.

The rest of this Chapter is therefore concerned with the progress individual learners have made.

Sources of Information About Learner Progress

Standardized Tests

As described in Chapter 3, the learners are tested using a range of instruments when entering the different programs. These tests are used for diagnostic purposes and learners are not subsequently retested using the same instruments. Progress in standardized tests is not therefore an available source of data about learner achievement.

Writing Samples

Another way of reviewing progress in literacy skills is to look at writing samples of learners over a period. Fingeret and Danin (1991) review the elements necessary in writing samples for them to be usable for analysis of progress in writing skills. These include:

- that the samples should be of some substance;
- that they should be at least six months apart;
- that they should reflect the writer's autonomous writing.

The writing samples available here do not meet these criteria; in addition, many of them are undated. No analysis of writing samples has therefore been done.

CAI Performance Records

A large part of the learning is effected using computer based instruction. Integral to most computer learning packages is a record of the progress made while working through the package. Such measures are of variable utility in assessing the progress a learner has made in mastering the skills and knowledge involved in a particular area of study. The computer can test whether the learner has mastered the exercises offered to tutor specific skills or knowledge. By definition, the computer can not check the success of the learner in transfering this learning to another context external to the computer. Yet literacy skills are indeed practised externally, in social situations dependent on interaction with other people.

Further, there is an element of self-fulfilment in making progress on a computer learning package. Since most such packages are carefully structured so that learning progresses incrementally, if the learner has started a unit at a level appropriate to their pre-existing skills and knowledge, and if the learner works through and completes the unit, it is likely that at least an adequate performance will be recorded, and that progress will be seen to have been made.

This is not to say that it is not worthwhile knowing whether somebody has mastered a unit that they are studying; on the contrary, this is of great interest. What it does mean is that since the computer management records only show progress on their own exercises, they do not show an *a priori* development of skills or knowledge.

In the CAI courses used at SLED, only a few are "strand" courses which develop incrementally, with the learner having to work through the unit section by section. The most commonly used strands course is Math concepts and skills. It covers nine grade levels with its own diagnostic test built in, which places the learner at an appropriate point within the course. The reports show how much progress has been gained.

Most however, are "lessons" courses where the learner can move around choosing the sections to be worked on. In the lessons, the "progress report" shows lessons completed, number attempted, number correct and total time spent.

If we are looking at learner progress, as opposed to the performance of the programs, time will be better spent identifying whether and how many courses have been completed, rather than analyzing the scores on the computer's tests.

Course Completions

An alternative way of looking at learner success in this context, is whether or not they complete their course of study, and the numbers doing so, in what space of time. In a changing workplace learning context such as this, course completions are partly a reflection of whether the learning can fit in with the

work as well as an indication of persistence and commitment from the learners. Course completions still do not tell whether a person is competent in certain skills and knowledge but they do provide a standard which can be more easily generalized and they do involve measures which are recognized outside the Center.

The rest of this section therefore deals with the course completions by learners in the first seven quarters of the project.

Course Completion Data

GED Course Completions

The GED course has its own externally validated test of course completion, the GED test. The GED class has enrolled a total of 45 learners (Table 4.2). Of these:

* two were dismissed and therefore not eligible to continue with SLED on leaving the company;
* fifteen are continuing learners;
* nineteen have graduated;
* nine have dropped out.

Graduates

Many of the 19 graduates completed very rapidly (table 6.1). This may partly reflect a pent up demand; many newly established adult learning programs that provide the opportunity to acquire qualifications not previously achieved, experience an early rush of people who have been waiting for such an opportunity.

Table 6.1
Number of quarters taken to graduate

Quarters	Persons
1	13
2	2
3	4

However, the one quarter graduations include several who enrolled in the summer of 1992, and not when the program started. Some of these may be people who dropped out of high school near, but before graduation, thus not achieving certification. For them, the GED may well be important in filling gaps on their vitae.

Dropouts

There is no exit interview data available to indicate why these people dropped out. One dropout was not an employee. It is not possible to say that they have dropped out absolutely. Many employees enrol in SLED for one or two quarters, stay out for several quarters, and then re-enroll. In view of the shift and departmental changes that happened during this period, it is not surprising that there should be dropouts and it is perhaps surprising that there are not more.

Continuing Learners

Of the fifteen continuing learners, most have enrolled recently. Three, however, have been enrolled for five or more quarters without graduating (though two are reported as having made great progress).

Job Enhancement Skills Completions

SLED consider the JES class to have been completed at about 150 hours or approximately two quarters. Successful completion of the course involves completion of the BASE course to a level of 80%, in addition to any CCC units being studied, especially the Essentials for Living and Working unit. However, in this group people may have enrolled for a variety of reasons and some have stopped because they achieved their goals, more limited or different in kind than completing a course at a specific level.

The JES class has enrolled a total of 44 learners (Table 4.4). Of these:

* four graduated or met their goals;
* fourteen are continuing;
* five dropped out (one of whom was the spouse of an employee);
* one is no longer employed at SLKP;

* five stopped attending for work related reasons (shift changes, supervisor attitude);
* two stopped for personal reasons;
* one has switched to CAI;
* one needed more specialized ESL study and has continued at Forsyth TCC;
* and eleven are unknown, and must be assumed to have dropped out. Most of these enrolled in the winter 1991 group and were from another plant, and therefore difficult for the SLED coordinator to track.

Computer Aided Instruction Completions

As mentioned in Chapter 3, the CAI units are considered to have been completed when a learner finishes the course of study with a score of 80% or more. There are 144 CAI students. So far:

* twenty one learners have completed from one to five course units;
* forty five are continuing;
* forty nine have stopped attending without completing course units;
* one was fired;
* twenty eight are GED/JES students

Of these, three have continued from CAI to JES or GED and three have moved from GED/JES to CAI. The comment about "dropout" made in the section above about the GED course applies even more strongly here, so these figures should be treated with caution until further investigation can be done. Furthermore, some who have apparently dropped out may still enrol in the current quarter. It is also clear that a number have stopped attending because of their work: moving to another job as fixer that requires extra training, moving to another plant, moving to a shift pattern that makes attendance difficult, especially for several living a great distance from the plant.

Continuing CAI learners

A key question about the continuing learners is the number of quarters in which they have been active since they enrolled initially. This information is summarized in Table 6.2.

Table 6.2

Continuing CAI Learners, Fall 1992

Quarter enrolled	Possible quarters	Number of quarters active 1	2	3
Spring 91	7	1	10	3
Summer 91	6	1	11	1
Fall 91	5	1	-	-
Winter 91	4	-	2	-
Spring 92	3	6	7	-
Summer 92	2	8	-	-
Fall 92	1	5	-	-

CAI "Drop Outs"

Table 6.3

CAI Learners who have dropped out

Quarter enrolled	Possible quarters	Number of quarters active 1	2	3
Spring 91	7	-	27	2
Summ 91	6	-	1	4
Fall 91	5	-	-	-
Wint 91	4	-	2	1
Spring 92	3	5	7	-
Summ 92	2	-	-	-
Fall 92	1	-	-	-

In the case of these two groups of learners, it would be worth further investigation if time permitted involving a study of the progress made up to the time of dropout or break in learning, using the computer records, combined with follow up interviews for those learners that can be located.

Metric Math Course

The group was pretested using the CASAS appraisal and TABE before the classes started. This in itself was a considerable time commitment in view of the short length of these courses (ten hours) and there was not time available for exit testing as well.

The course involved considerable use of hands on exercises and the instructors monitored the ability of the learners to complete each exercise. In other words, a coaching system was used with each learner until competency was assured, supported by peer tutoring. This could be regarded therefore as competency based assessment, though detailed records of the achievement of each participant were not kept.

Several metric math students subsequently continued with JES or CAI courses. A memo from management following the course indicated that the course was seen as successful and that it had "provided the basic groundwork for the entire department and our ability to convert to this form of measurement". (1)

The Interactive Knowledge Field Test

Thirteen learners participated in a field test of the interactive software in February 1992. Of these, eight were JES students, but they included two GED students, two were CAI students and one supervisor who was not enrolled at the Center. Additionally, two JES students registered for the Unit but did not start work on it. Of the thirteen who started the Unit, twelve completed it. Their average scores and the time they took to complete the unit are listed in Table 6.4.

There seems to be a slight pattern in this data of the quickest learners gaining the highest scores and vice versa,

Comments reported about this field test were that the participants enjoyed it, valued the content being based on their field of work , and that it helped them understand some of the processes they were engaged in.

Table 6.4

IKFT Scores

Student:	Ave % Score	Time taken	Sessions taken
(sup)	94	64 mins	2
(JES)	94	200 mins	2
(GED)	92	120 mins	2
(CAI)	85	263 mins	3
(JES)	81	117 mins	3
(JES)	77	323 mins	3
(GED)	74	211 mins	2
(JES)	72	139 mins	3
(JES)	72	247 mins	4
(JES)	68	305 mins	2
(JES)	68	407 mins	7
(JES)	61	264 mins	4

Summary

Measured in terms of course completions, a significant number of learners have successfully completed work at SLED. We know insufficient about learners who have dropped out, and about the pattern of being active/inactive amongst many learners.

Notes

(1) Memo from Jim Davis to Deborah Gaddy dated 8/25/92.

Chapter 7

Findings and Recommendations

Findings

It is apparent that this Project has been in a continuous state of development, at the same time that the plant in which it is located has been in a continuous state of change. Additionally, it is clear that many of the participants in the process see the Project as contributing models and knowledge which will subsequently be available for extension, if not replication, in other Sara Lee plants and even in other companies in and beyond the textile industry.

These findings are therefore as much concerned with formative as with summative issues.

1. Provision of Workplace Literacy to the Workforce

SLED has been a successful provider of workplace literacy in its first two years of operation to about half of the staff of the SLKP facility at Stratford Road. This has been achieved despite a background of continuous change at the plant and turnover of staff.

The facility has been well received by the people who use it. They appreciate both the computer based learning and the opportunity to work with teachers.

2. Users

The information about the users can not be used to derive any profound findings as we do not have data about the workforce of the whole plant with which to make comparisons. The data does show that users are dominantly in the age group 26 to 50 with fewer older and younger users; that there are slightly more women than men in the group-taught classes but overall slightly more men; that there are slightly more white than black users except in the JES class; and that the majority have been employed at SLKP for three or more years, with a large number having worked for more than ten years.

One clear finding about users is that most have a previous education of G12 or above, apart from those attending specifically to acquire a GED.

3. Non-Users

About half the workforce has so far not used SLED. It would be astonishing if a higher proportion of the target population had used such a facility during its first two years. We do not however, know *who* is not using SLED. In view of the perception that there are many people in the plant with low literacy skills, and that most of the users are high school graduates, it is quite possible that the non-users include people for whom the facility was intended; there is some suggestion from users that they have colleagues who need help with literacy and who are not coming forward, partly because of anxiety about admitting their need.

We do not have any further data to develop any insights into this important question.

4. Completion, Drop-Out and Continuity

Learners can be broadly divided into three major, broadly equal groups; those who have achieved their objectives, those who are continuing and those who have dropped out. We do not know why some have dropped out. It is not unusual in this sort of learning to get a significant proportion of drop-out and we have some indications that some drop-out has been caused by shift changes and other work related factors. We have also noted that there is a recurring pattern of activity and inactivity, with breaks between; in view of the short period that SLED has been operating, it is not even possible to say authoritatively that all the apparent drop-outs have completely stopped attending. This is an area that we should like to know more about.

5. Why Learners Used SLED

SLKP workers used SLED for a variety of reasons. One significant group wanted to acquire a GED. It has been noted that in the early stages of any such project, we would expect to find a backlog of demand for courses that enable people to

complete previously unfinished learning, and to acquire qualifications. It will be interesting to see if this particular demand continues.

Most learners expressed a desire to improve their education so as to be more effective in their jobs. They were also interested in moving jobs, either for promotion (though they did not have high expectations of promotion as a result of just improving their education), or to jobs that paid better or were less stressful. They also wanted to be more competitive in the job market so that they could have the freedom to move, or find other work if their jobs finished. Many also wanted to improve their education for personal and family reasons.

The learners wanted to improve their math, in particular to be able to do practical things like measurement and calculations related to their jobs; to improve their computer experience and knowledge; and wanted to improve their reading and spelling, and to a lesser extent, writing.

6. Learner Outcomes

A significant number of learners have successfully completed their courses of study or are continuing to work on them.

Of equal importance, many learners have experienced great increases in their self-confidence as learners and in their behavior. Some have moved on to doing other things (attending curriculum courses at Forsyth TCC, participating in a writing project, changing jobs); some have changed jobs at SLKP; and others report an improvement in how they handle life.

7. Learners' Subsequent Careers

We do not have data about the subsequent careers of people who have used SLED. The facility has been running for too short a time for any extensive tracking to have taken place. The information available suggests that a significant proportion of learners do make life changes, take place in further learning, or pursue other activities after studying at SLED.

Some research suggests that achieving a qualification like a GED does not of itself lead to job mobility. Other work suggests that the experience of taking

part in adult learning is itself linked to mobility for some people. It is possible to suggest that the mobility and subsequent career of learners is as good an indicator of the success of an adult, learning facility as the formal outcomes that the learners achieve. It would be useful to track the subsequent careers of learners at SKLED more systematically.

8. Recruitment and Initial Assessment

SLED spends a considerable amount of time recruiting, interviewing and testing applicants. Some of the people interviewed do not proceed to study with SLED, and some could possibly achieve their learning needs elsewhere, but we do not have any extensive data on this group.

The entry point to adult learning may be "gate keeping" which serves to sift some people out, or "door opening" which serves to help them get started. Many adults who have not studied for a long time, or who have previously experienced themselves as educational failures, have severe problems of self-confidence, anxiety and shame. These self-perceptions may inhibit them from approaching a learning opportunity and also makes the first contact with the learning organization critical; it can ease them quickly into successful learning or it can again put them off, adding to their negative self-image.

The time spent with new learners in recruitment and at the beginning of their work with SLED may be seen as a distinct activity, separate from the instructional work itself. This phase is not however documented as a distinct activity, records being merged in with records of particular learning activities. It is not seen organizationally as a separate part of the program either, being experienced as a huge work load at the beginning of a new course or quarter that slows down the process of instruction.

Some fresh thinking about this phase of the program would be beneficial.

9. Work Relatedness of the Curriculum

Early on, the SLED staff spent time reviewing the skill and knowledge content of jobs at the site. The SLED staff have also spent time creating purpose-written teaching material that is directly work related; much of the material used is however, not of this type.

There are some identified limitations for specific job related materials. When job-based activities and worksheets are written by the instructors, this has to be in their own time as they are not paid for preparation time; this is an extra load on instructors and dependent on their goodwill. It also makes it difficult for the instructors to plan a work-related curriculum in a systematic way. Furthermore, the rapidly changing nature of the jobs at the plant, and even of the work of the plant itself, makes some of the work related material somewhat less directly relevant than at the time of its writing.

The CAI units used are commercially produced and therefore written for a wider audience than SLKP workers. This is an inherent weakness of using commercially produced material aimed at a general education market.

There has been no possibility of evaluating the value of the purpose -written interactive knowledge program since the first ten units of this only became available as this evaluation was being completed. The field test module was however well received by the learners who tried it.

There is no evidence available to this study that suggests that a work-related curriculum is inherently preferable in work-based educational projects. However, where an effort has been made to tailor the curriculum to the needs of the learners, this is appreciated by the learners and in some cases also appears to enhance their understanding of their jobs. In some cases, the learners themselves appear to make the connections between curriculum and its application to work. This is an area where further work needs to be done.

10 .Approaches to Instruction

The instructional approach used employs both individual work on computers and work with instructors, individual and in groups. Both are valued and play an important part in the instruction provided. It is important to note that possibly the most important aspect of the instruction is the interaction of the two. It is clearly essential that individuals using computer learning have access to instructors, not just to deal with problems but also to share progress.

It is an equally important aspect of instructor-led teaching, that some of the work is in groups, some is individual work with the instructor, and some is

individual work with a computer. We do not however have adequate data to make any conclusions about the interactions that take place in these different formats; it is however an area about which we should know more, both to evaluate the instructional role of SLED and to help in the development of the instruction that takes place.

11. Data Management

The processes that have been used to collect much of the data, for this evaluation, especially the statistical data, mirror the issues that have existed for the Project staff in working with, documenting, monitoring and validating the work that Sara Lee workers have been doing at SLED, during the first stage of project development. As other aspects of the project develop, so too should we expect the data recording systems to develop. This is not just for evaluation purposes.

Learners working in an individualized learning framework, inherent in much computer-based instruction, need excellent support. In many ways, the support they need is greater than the support needed in group teaching, where the group processes themselves offer support to the participants. The support is, by definition, not always immediately available face-to-face. Procedures that will facilitate optimum communication between learner and instructor, around each learning event, will need to exist. If the potential of the computer-based learning facility is to be fully realized (which would mean it would be available whenever workers are at work, which in turn could mean up to 24 hours per day, seven days a week), such procedures will be needed even more. They will involve precise, and preferably computer based, records, involving not just who did what, when, for how long and with what effect, but the issues and outcomes that arose from the learning event.

Such records would, *inter alia*, provide high quality, and very easily accessed data for monitoring and evaluating the processes and the outcomes of learning.

This is <u>not intended</u> as a criticism of the documentation kept at SLED, but as a critique of one overriding aspect of managing a computer-based learning system which warrants attention in the future, not just because good records

are necessary, but because it is at the very heart of supporting learners in achieving successful learning experiences and outcomes.

12. Centrality of Time:

In the original funding proposal, it was noted that providers of adult literacy programs are faced with a series of problems that place real limits on the ability of adults to participate: "Program costs (tuition), cost of transportation for adults wanting to participate, time constraints, costs of child care, etc, are some of these stumbling blocks. Meeting adult literacy needs in the workplace has proven successful in overcoming most, if not all, of the barriers cited above." (1)

As expected, this study shows no impact from three of these factors. However, one of them, namely *time*, recurs as a potent element in the ability of workers to use SLED. Time is organized around the company's production needs. It is organized in ways that facilitate or prevent workers attending SLED; it is in fact a dominant structuring element in their lives. This is not surprising, since the needs of production are always going to dominate any workplace provided educational facility. It is not a problem to be overcome but an element of the context to be worked with.

Additionally, the work at SLED is organized in phases of two sorts: the course provision follows the quarters used at Forsyth TCC; programs follow a process of recruitment, assessment/enrollment, instruction, continuation or leaving. There is probably inadequate congruence between the way these three organizing principles are integrated and it is an area that needs further work.

The use of individualized instruction is one response to this element but just providing computer based learning by itself does not resolve the issue. It involves timing and scheduling. An element to be looked at in further study is the precise times people come to work on individual programs at SLED, why they come then, and when they might optimally come.

Recommended Program Adjustments

1. *Identify non-users* and find out why they are not using SLED.

2. *Conduct exit interviews* on a systematic basis with people completing courses of study at SLED.

3. *Review progress with learners* who have been registered with SLED for more than two quarters, and periodically thereafter, to check progress towards goals.

4. *Broaden the curriculum.* Many SLED users are working on topics which are not literacy related. This is not a criticism but an accurate reflection of the range of learning needs that adult workers have. SLED should actively work to identify other training the center could be doing, both computer based (e.g. LOTUS) and process based.

5. *Record keeping.* Review the record keeping to make it more comprehensive and systematic. Ideally, all records should be computerized.

6. *Include learner progress* in this development of record keeping. This should not only include a computerized record of each learner's progress and achievements in each of their areas of study, but should also include a portfolio of learning outcomes which could include writing samples and other evidence of learning.

7. *Develop the counselling and advising role* as a distinct element of SLED's work.

8. *Develop time models for SLED* that are based on the time patterns of the plant and of the users' lives, and that take full account of the pattern of learning at SLED, rather than on external and more remote factors.

9. *Develop management systems* appropriate for computer-based learning systems. (2)

10. *Curriculum focus.* More work needs to be done to focus the curriculum and this work should focus as much on the workers' individual skills, needs and

wants. That will *inter alia* involve work-based topics and skills. Curriculum with such a base should emphasize skill transfer rather than job-specificity so that not learning is not too locked into technology which is changing fast, and which not be relevant in other and subsequent work roles.

11. A change of emphasis. There is a major change of emphasis which would provide an enabling context for many of the previous recommendations; it is however suggested last since it is a suggestion which, while desirable, is not a prerequisite for the earlier recommendations.

Such a change would involve a move in emphasis from "workplace literacy" to "workplace learning". This would view every worker in the plant as having a learning entitlement, and acknowledge that all adult workers have learning needs. It would enable SLED to present its work as being for everyone, both making it available for people with other, non-literacy needs, at the same time as making it a less exposing experience for people with literacy needs to come for help. The user base would be whole staff so that SLED could move from a user/nonuser model to an active/inactive model, enabling a different perspective to be taken on non use. Within such a model, it would be preferable that all staff have the opportunity to be interviewed about their learning needs, whether they are to be met at SLED, to be met elsewhere, or to be left unacted upon at present. It is not suggested that there should be any element of compulsion in this; rather, the existence of the learning facility should be presented and seen as one of the benefits available to SLKP workers. It is not suggested that literacy education should be de-emphasized in this approach, but rather that it should be seen as one of the valid range of learning needs that all adults possess.

Suggestions for a Second Year of Evaluation

A number of these program recommendations would have implications for further evaluation. The evaluation team could usefully work with SLED staff to review how developments in the organization of the project could also help with ongoing, third-party and self-evaluation. There are however, also a number of distinct themes that are recommended for inclusion in further third-party evaluation.

1. Tracking users. Users of SLED should be tracked more closely over a period of at least a year, in terms of attendance, activity during presence in the Center, absence and reasons for it, and achievements in the activities being worked on.

2. Dropouts. should be traced and interviewed to find out why they no longer are using SLED.

3. Exit interviews should be conducted by evaluators for people identified by SLED staff as completing courses of study.

4 . Non-starters and non-users should be interviewed more extensively to find out why they are not using the facility.

5. Curriculum should be looked at in more depth, in particular to identify: the interaction of instructor-led and computer-based learning; the impact of different inputs; and to clarify the range of work-based instructional elements present and possible, and the relevant value and impact of each.

Notes

(1) NC State University, Literacy Systems Center, "The Workplace Literacy System Project", Proposal to the US Department of Education, National Workplace Literacy Program, July 1990.

(2) Much work has been done elsewhere on this topic and a first step might be to look at the experience of other computer-based learning systems such as those in Britain which have been extensively developed in the last twenty years. See for example the series of "Open Learning Guides", edited by Roger Lewis and published by the (English) Council for Educational Technology in 1984/85.

Appendix A

Methodology

Approaches Used

This project has used a variety of methods including two major data collection exercises.

The principle investigator conducted a series of open-ended interviews which were taped, between August 1991 and February 1992. These were:

- a group interview with GED students (August 1991)
- a group interview with JES students (August 1991)
- two individual interviews with JES students (September 1991)
- five interviews with GED students, one a graduate (September 1991)
- an individual interview with a non-participant (September 1991)
- an interview with the senior industrial engineer (September 1991)
- an interview with two white female supervisors (September 1991)
- an interview with a white, male supervisor (January 1992)
- an interview with a black male supervisor (January 1992)
- an interview with two instructors (January 1992)
- an interview with the workplace literacy specialist (January 1992)
- an interview with the third instructor (January 1992)
- a second group interview with the JES class (February 1992)
- a second group interview with the GED class (February 1992)

• a second interview with one instructor (February 1992)

A total of 25 workers, five supervisors and managers, and four SLED staff participated.

These interviews were transcribed and analyzed inductively for patterns.

In addition, the principle investigator observed a number of class sessions and talked with all the principals involved.

Subsequently the second investigator analyzed the learning records that were available and reviewed the files of all the learners to see if they contained any data that would enable learner progress to be analyzed. These were all paper based and this exercise involved:

• compiling lists of learners in the GED and JES classes from the registers kept for Forsyth TCC;

• compiling lists of learners from the sign in sheets for the metric math courses;

• compiling lists of CAI learners from the quarterly registration forms: weekly sign in sheets were not analyzed;

• compiling biographical data for all these learners from the participant pre-entry survey form that all learners are expected to complete on entry to SLED.

In addition, the records of people involved in the Interactive Knowledge Field Test were copied from the computer. A statistical description of the project was prepared from this data though no statistical analysis was carried out on the data.

The second investigator also spent time working through one unit of the revised Interactive Learning Package.

He also interviewed the workplace literacy specialist again.

The workplace literacy specialist was invited to comment on a draft of this report.

Appendix B

CAI Course List

Mathematics and Science	hours	
MCS: Math concepts and skills	245	
PS: Problem solving	100	
EM: Math enrichment modules	50	
LOG: Introduction to logic	100	
AT: Algebra topics	50	
SD: Science discovery	15	
Reading		
RR: Reading readiness	35	[not used]
IR: Initial reading	60	
BR: Basic reading	25	[not used]
RW: Reader's workshop	120	[not used]
CRS: Critical reading skills	100	
ARS: Adult reading skills	50	[not used]
TRN: The reading network	50	
Language Skills		
SPS: Spelling skills	175	[not used]
LS: Language art strands	100	[not used]
WE: Writer's express	25	[not used]
WPS: Writing process and skills	50	
ESL: English - second language	600	
FUN: Fundamentals of English	25	
ALS: Adult language skills	50	
Basic Competency		
KS: Keyboard skills	10	
PRS: Practical reading skills	25	
SS: Survival skills	50	
GEDP: GED preparation	60	
ELW: Essentials for living and working	?	
Computer Education		
CLE: Computer literacy (begin)	20	
CLS: Computer literacy	25	
BP: Programming with BASIC	50	
PAS: Computer science with PASCAL	80	
COB: Data processing with COBOL	50	[not used]
UX: Introduction to UNIX	10	[not used]

References

anon, "Adult Literacy in North Carolina and the Role of the North Carolina State University Literacy System Center". Raleigh: NCSU, January 1992.

Fingeret, Hanna, "Draft Evaluation Plan for Sara Lee Workplace Literacy System Project". Durham, NC: Literacy South, July, 1991.

Fingeret, Hanna and Danin, Susan, "They Really Put a Hurtin' On My Brain" : Learning in Literacy Volunteers of New York City". Raleigh, NC: January 1991.

Gaddy, Deborah, "Sara Lee Educational Development 1990-91". Winston Salem, NC: Forsyth TCC and Sara Lee Knit Products, 1991.

Lewis, Roger (Ed), "Open Learning in Action", Open Learning Guide 1. London: Council for Educational Technology, 1984, and others in the series.

NC State University, Literacy Systems Center, "The Workplace Literacy System Project", Proposal to the US Department of Education, National Workplace Literacy Program, July 1990.

Therrien, Lois, "This Marketing Effort Has L'Eggs", *Business Week*, December 23, 1991.